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Canadian Pulp and Paper Men Meet at Montreal

While Annual Banquet is Cancelled Out of Respect to Passing of King George, Convention is Great Success in Point of Attendance and General Interest in the Various Meetings—R. A. McInnis, General Manager of Anglo-Canadian Pulp and Paper Mills Ltd., Is Elected President of the Association—Reports of the Sections

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., February 3, 1936—While the passing of King George cast a shadow of restraint over the annual meeting of the Canadian Pulp and Paper Association here today, and brought about the cancelling of the annual banquet which it had been planned to hold after a lapse of several years, the meeting was a highly successful one from the point of view of attendance, while as regards the many technical papers read at the preceding annual meetings of the Technical and Woodland Sections, and the discussions which ensued, it was perhaps the most interesting and informative in the history of the association. The general feeling pervading the meetings was also more hopeful than for some years past, the reason for this being the steady improvement in business conditions in Canada and in the countries to which the industry exports its products, and the fact that the past year has been one of continuous expansion in the demand for newsprint, with every sign at the moment that this demand will continue to improve. The price of newsprint, also, will be one dollar per ton more in the current year—or at least it starts out with that increase—and while this is not as much as had been hoped for, it does mark the start of a movement in the desired direction. The keynote of the general sentiment was expressed by the President, who said: "All indications are that we can look for a better and more prosperous year in 1936 than we experienced in 1935, and I trust that our hopes will be realized to the full."

Presidential Address

Brigadier-General J. W. White, the president, was in the chair, and his opening address was as follows:

In reviewing the past twelve months it is perhaps in order to strike a little more optimistic note than we have been able to do for some years past. General business conditions in Canada during the past year have shown a steady improvement and have been better than in any year since the depression commenced. The usual business indexes have practically all shown an upward trend, some more than others; none spectacular, but all moving in the right direction. There was an increase in industrial employment and a brighter situation in the West. Several industries established record high production levels and our foreign trade increased. Building construction and the heavy industries still lag behind, but in general it seems that we are making progress and slowly coming into a period of more normal conditions. Canada is still confronted with many problems. Heavy taxation, unemployment and the railway burden are still with us. On the whole, however, we may congratulate ourselves on the progress made in the past year and the indications that progress will continue during the coming year.

The pulp and paper industry has had some share in the improved conditions. There was an increase in demand for our products which enabled most of the mills to operate on higher schedules than in the previous year although still leaving a good deal to be desired in that direction. This increase in output was helpful to some extent in offsetting the higher costs of raw materials and supplies.

The chemical pulp mills experienced a little better demand but prices were reduced early in the year to meet comptition. This reduced level of prices remained fairly stable throughout the balance of the year. The mechanical pulp market, which has been in a depressed condition for several years past, showed signs of strengthening towards the end of the year and it is hoped that this movement will continue as these mills have had a difficult struggle for a long time.

New High Record for Newsprint

The newsprint mills established a new high record of production, the total output for the year being greater than in the previous peak year, 1929, by a small margin. It is to be regretted that the price situation was still unsatisfactory, and the moderate increase of $1 per ton for 1936 does not offset increased costs.

Increasing shipments of newsprint to our principal market—the United States—are indicative of improving conditions there.

In the fine paper group the year was marked by an improvement in demand and an increase in production. As these grades have only the domestic market to rely upon, their prosperity or otherwise, naturally depends on conditions within Canada, and the improvement in the general business situation benefitted them. One of the principal difficulties of these mills is lack of volume, which results in higher operating costs. The ingenuity of operators has achieved success in developing new lines of paper

(Continued on page 24)

Northern Paper Mills Controlling Interest

Paul V. Cary, Trustee of Patten Paper Co., Appleton, Wis., Attempts to Hold Block of 40,000 Shares—Stock Had Been Held by Company and Mrs. Judson G. Rosebush—Success of Move Would Facilitate Reorganization of Patten Paper Co.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., February 3, 1936—Future control of the Northern Paper Mills, Green Bay, Wis., appears to hinge on the outcome of litigation now in progress in the Federal District Court of Judge F. A. Geiger at Milwaukee. The success of injunction proceedings filed by Paul V. Cary as trustee will mean not only the transfer of the controlling interest to George F. Newton of Iron Mountain, Mich., but also the reorganization of the Patten Paper Company, Ltd., Appleton, Wis., under section 77B of the national bankruptcy laws, without loss to the stockholders.

Mr. Cary as trustee of the Patten Company is attempting to hold intact a block of 40,000 shares, understood to be the controlling interest, in the Northern mills, and a part of which already had been sold under foreclosure proceedings. The stock had been held by the Patten Company and Mr. and Mrs. Judson G. Rosebush.

Mr. Rosebush, who is president of the Patten Company, was general manager of the Northern Paper Mills until last September, and through purchases of stock by the Patten Company and himself and Mrs. Rosebush had over a period of time acquired the controlling interest. He pledged 10,000 shares of the stock as collateral on loans from the Northern Mills, and lost the control when the loans were foreclosed, and the stock was sold to directors of the Northern.

A temporary order was issued recently by Judge Geiger restraining certain officers and directors of the Northern company from purchasing stock representing Rosebush interests in the Northern; also from entering negotiations to purchase the stock or from soliciting proxies from holders or owners of the stock.

The order asked that cause be shown why the sale of stock on November 29 to A. B. Weissenborn, R. H. Purdy, F. J. Harwood, Earle Murrey, W. P. Wagner, A. F. Tuttle, G. E. Buchanan and Estella A. Goodman (representing the interests of R. B. Goodman, deceased) should not be invalidated and this stock delivered to Paul V. Cary, Patten trustee, and that they file their claims instead as a lien against the proceeds of the sale contemplated by the Patten Company and Mr. Rosebush. The above are officers and directors of the Northern. About 3,500 shares were involved in this foreclosure sale by the sheriff at $5 a share.

The order also asked that O. A. LaBudde, collector of internal revenue, file in Federal Courts the Government's claim for additional taxes assessed against Mr. Rosebush, for which a lien has been created on stock of the Northern Paper Mills.

Previously, an order was obtained involving 7,000 shares of Northern stock posted as collateral with an Appleton bank. Mrs. Rosebush has claimed that these shares were her property, and an injunction was obtained restraining the sale. A syndicate of directors purchased Mr. Rosebush's notes from the Appleton bank, and later purchased the 3,500 shares, deposited as collateral, at the sheriff's sale.

Mr. Cary sets forth that under the plan of reorganization, the Patten Company plans to sell 40,000 shares of Northern stock which it owns, on which it has liens, or which it plans to secure, to George F. Newton of Iron Mountain, Mich., at $16 a share, realizing sufficient from the sale to complete its own reorganization without loss to stockholders. The sale is conditioned, however, on the conveyance of a majority control, which can not be effected without stock originally owned by Mr. and Mrs. Rosebush, pledged by them as security for various loans, in which they have assigned their equity to the Patten Company. The petitioner also claims the sale of the controlling interest at $16 a share would bring a far better price than if the stock were sold piecemeal.

Hearings on a permanent injunction and approval of the Patten Company's contract to sell the block of 40,000 shares were begun Saturday, February 1, before Judge Geiger, but the outcome will not be known until later. Should the injunction be dissolved, the directors of the Northern company will hold their present control of the concern.

Quarles, Spence & Quarles, Milwaukee, attorneys for the Northern directors, reviewed before the court the transactions relating to loans to Mr. Rosebush, and the pledging of the 10,000 shares as collateral. The rights of the Northern directors in protecting their loans by the sale of the stock were defended. Mr. Cary appeared for the Patten Company, and challenged the right of the directors to interfere with the sales or purchase of stock owned by Mr. Rosebush.

Safety Conferences Planned

Plans were made last week for two district safety conferences next summer, in which most of the paper mills of the state will participate. The general committee of the Wisconsin Valley Safety Conference met at Stevens Point, with luncheon at the Hotel Whiting. Nekoosa, home of the Nekoosa-Edwards Paper Company, was chosen as the location, and the date will be June 4. An outstanding program is to be arranged, with a major sectional meeting for executives and employees of paper mills.

The executive committee of the Fox River Valley and Lake Shore Safety Council met for luncheon at Manitowoc, and made preliminary plans. The conference date has not been set, but it will be staged jointly early in the summer by Two Rivers and Manitowoc, and will be held at the latter city. Frank Tom, Manitowoc, is to be the general chairman.

News of the Industry

Kenneth McDougal, research assistant at the Institute of Paper Chemistry, Appleton, Wis., has resigned to accept a position in the engineering department of the General Electric Company. He will be stationed at Fort Wayne, Ind. Mr. McDougal has been with the Institute since September, 1934, and formerly was employed by the General Electric Company. His successor has not been announced.

The Sterling Paper Company, Eau Claire, Wis., is preparing to log a tract of timber it owns near Morse, Wis. A railroad siding is under construction preparatory to operations.

The death is announced of Edward N. Stroesser, president of the Economy Paper Company, Milwaukee, Wis. He passed away last week, after a brief illness. He was largely responsible for the upbuilding of the company to a place of prominence in the manufacture of florists' wax wrappings.

R. J. Cullen Heads International Paper Co.

Succeeds A. R. Graustein, Who Resigns as Both President and Director But Has Agreed to Assist During the Transition Period—Move, Which Came as a Surprise, Said to Be Due To Policy Dissension—New Head is Widely Experienced Paper Man

Archibald R. Graustein resigned on Tuesday as president of the International Paper Company and was succeeded in that office by Richard J. Cullen, vice president of the company. The following statement regarding the change was given out at the offices of the company on Tuesday afternoon:

Announcement by the Company

"The directors of the International Paper and Power Company today announced that A. R. Graustein had resigned as president of the International Paper and Power Company and of the International Paper Company. R. J. Cullen, who has been for some time president of Southern Kraft Corporation and other paper subsidiaries, was elected president of the International Paper Company. At the request of the board, Mr. Graustein has agreed to assist the company in the transition period."

ARCHIBALD R. GRAUSTEIN

These changes, were said to have resulted from increasing dissension between Mr. Graustein and the directors of the two companies on matters of policy.

Mr. Graustein Elected President in 1924

Mr. Graustein was elected president of International Paper on May 29, 1924, to succeed the late Philip T. Dodge, who remained as chairman for a year thereafter. Mr. Graustein had joined with Boston interests, represented in earlier battles for control of International Paper by Malcolm G. Chace, now a director of International Paper and Power.

The directors were unanimous in their resolve to place the paper business solely in charge of a trained industrialist and are understood to have offered the post of chairman of International Paper and Power to Mr. Graustein, who prior to 1924 was a partner in the Boston law firm of Ropes, Gray, Boyden & Perkins.

Because of the steady expansion of the International Paper Company's investments in the power industry, International Paper and Power Company was formed in November, 1928, and work was begun to segregate the paper and power activities between International Paper Company and subsidiaries and International Hydro-Electric System and subsidiaries.

This was accomplished, but the depression arrived midway of the task, considerably altering values. Some months ago International Paper and Power wrote off its entire investment in the International Hydro-Electric System. Later the latter company's investments in American utilities were segregated in a trust. In addition, some months ago International Securities Company was dissolved and its holdings of International Paper and International Paper and Power stocks were returned to those companies and canceled.

To Refund Bank Loans

Meanwhile, the progress made in developing the Southern Kraft Corporation under Mr. Cullen's guidance has placed the group in a position to undertake the early refunding of bank loans amounting to some $14,500,000.

As a result of the resolution of the directors of the International Paper Company to devote its activities to increasing the production of various forms of paper at the lowest possible cost, and to push distribution, the rôle of International Paper and Power Company will be solely that of an inactive owner of stocks in the paper and power divisions.

Control of the holding company lies 25.4 per cent in the hands of the Phipps interests, through which Mr. Graustein originally rose to power; 12.4 per cent in the hands of nominees for the Chase National Bank, largely as a result of purchase of collateral pledged by Continental Shares some years ago, and about 6 per cent stands in Mr. Graustein's name, with some 4.3 per cent owned by United Light and Railways or affiliates.

Mr. Cullen's Connection with the Company

Mr. Cullen's first connection with the International Paper Company was about ten years ago when the Bastrop Pulp and Paper Company, of Bastrop, La., with which Mr. Cullen has been prominently connected, was purchased by the International. Following acquisition of this organization, he was made vice president of the company. He was made president of the Seminole Paper Company of Chicago when control of that concern was acquired by the International Paper Company in 1931. At about the same time he was also made president of the Continental Paper and Bag Corporation, another subsidiary of the International Paper Company and he has been head of the Southern Kraft Corporation since its organization.

Paper Demand Moderately Active in Toronto

Volume of Sales and Consumption of Various Grades of Fine Paper Gradually Increasing—Coarse Paper Manufacturers Less Busy—Box Board in Excellent Request, With Future Outlook Promising—Light Weight Papers Moving in Good Volume

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., February 3, 1936—While the wholesale end of the paper trade has not yet reached its full stride for the present year, business for the opening month of the new year is generally described as fair. Quiet conditions prevailed in the early part of January but there has been a general improvement in the sale and consumption of fine papers and the first month of the year closed with a fairly satisfactory turnover.

Paper merchants generally are optimistic as to the prospects for good business early in the year and are inclined to stock up a bit particularly on the higher grade papers which are coming into demand again. The printing trade has shown some signs of improvement and many firms are buying to a freer extent than they were a year ago. Lithographing firms are quite busy and there is a good consumption of paper by the publishing trade.

The coarse paper trade is still somewhat backward and mills are not as busy as those devoted to the manufacture of fine papers. On the other hand the paper board mills are quite busy under a fairly good demand for board from the paper box trade which is showing some disposition to improve in volume. There is not much change in the paper converting end of the paper industry and a quiet market prevails in ths department in respect to general stationery lines and envelope manufacture. A nice business is being done in light weight papers, tissue and toilet manufacturing plants being quite busy. There is also a fair demand for waxing, greaseproof and glassine lines.

Paper Box Industry Gained

Production of the paper box and bag industry in Canada in 1934 was valued $21,035,434 as compared with the corresponding figure of $17,800,330 recorded in 1933, according to figures just released. The products manufactured, in order of their importance with regard to value, were: corrugated boxes, $6,810,043; folding boxes, $4,217,807; set-up boxes, $749,027; envelopes, $431,158; corrugated paper and wrappers, $241,685; drinking cups, $239,185; special bags of glassine, Waxed paper, Cellophane, etc., $188,071; printing and lithographing, $139,990; egg case fillers, $90,135; millinery bags, $76,178; all other boxes and cartons, $71,952; all other products, including adding machine rolls, Cellophane garment coverings, fiber containers, writing pads, papeteries, etc., $1,110,628.

Newsprint Industry's Good Outlook

The Canadian pulp and paper industry has entered on the new year with many indications that as a whole it is rapidly working into a new and sounder position. The main factor in the improved outlook is the greatly improved demand which has developed for the product. While this increase in demand has come chiefly from the United States, which is the largest customer of the Canadian mills, there has likewise been an increase in the market for the Dominion's newsprint in South America where the circulation of newspapers has been increasing by leaps and bounds.

Already it has been found that the demand for the product of Canadian mills has increased to such an extent that several are working close to capacity, and some of the larger producers are making arrangements for reopening plants which had been closed down. It is believed that it will not be long before the Canadian producers who have hitherto lacked tonnage will secure good business. While the contract price set for 1936 has been a disappointment, there is said to be evidence that some of the publishers are already in the spot market to provide for their increased requirements and will be bidding substantially higher prices for the larger amounts required at certain periods of the year.

Big Timber Used for Pulpwood

Thorsten Ehn, supervisor for the Department of Lands and Forests, who returned to Port Arthur lately following a trip of inspection to the Provincial Paper Mills camps in the Hurkett district, said that he found conditions in the camps excellent. He said that during his various inspection trips he had found considerable big timber cut into pulpwood. This will not be permitted by the department in future. Big timber, Mr. Ehn said, must only be taken out as saw logs or boom timber, or left standing as seed trees. The department has been promised the co-operation of the district operators in this respect and no trouble was expected, Mr. Ehn declared.

Gefaell Plan Lesser of Two Evils

It is reported that a number of the large investment institutions which were supporting the opposition to the plan of reorganizaion of the Great Lakes Paper Company, which was approved by Mr. Justice McEvoy on December 23, have changed their minds and now believe that the Gefaell-Aldrich proposal, which had the backing of Colonel Knox of the *Chicago Daily News,* is the better one for both Great Lakes bondholders and for the newsprint industry in Canada. But so far as can be learned from legal sources, the time is passed for the giving of proxies.

The real battle is scheduled for the appeal court at Osgoode Hall, Toronto. The appeal, entered by a company called Western Investments, Ltd., as a bondholder, claims that Mr. Justice McEvoy erred in permitting forty-six per cent. of the outstanding bonds to approve of the Gefaell-Aldrich plan while there was a protesting vote of approximately 14 per cent. of the outstanding bonds.

One result of the Great Lakes deal may be that legislation may be introduced in Ontario to exercise a greater measure of control over the newsprint industry, as in Quebec. It will be recalled that the Ontario Government announced that it would actively oppose the Great Lakes sale. It is expected that the appeal decision will be announced within six weeks. If the Great Lakes appeal is upheld, the new securities of Upper Lakes Pulp and Paper Company would be ready for issue to present holders of Great Lakes bonds and to creditors by April.

Schroon River Pulp & Paper Co.

WARRENSBURG, N. Y., February 3, 1936—The annual meeting of stockholders of the Schroon River Pulp and Paper Company was held this week at which Albert L. Emerson was re-elected president. Other officers chosen included Joseph Giannini, vice-president; Franklin E. Pasco, secretary, and Philip Rice, treasurer. Among those chosen directors were the officers with Karl G. Kaide, Walter P. Mack and Walter Groves.

Philadelphia Demand Exceeds Expectations

Increase Indicated of 18 Per Cent in Volume of Sales of Fine and Coarse Papers During January, Compared to December, 1935—While Business Conditions Are Good, However, Long Term Commitments Are Scarce, Due to Modified Uncertainty Regarding Future

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., February 3, 1936—There is unanimity of opinion in the fine and coarse divisions of the paper industry here that January of this year was far ahead of their expectations—in one of the leading houses here it was stated that although all the figures for the month were not in, at this writing, it was safe to say that they were 18 per cent ahead of December, 1935. On the whole, 1935 made a much better showing than 1934, and as your correspondent made the rounds it was learned that 1936 looks good to them, "but something is holding business back from its full strength."

In explanation of the latter, they say that orders are coming along in fair volume but few of the orders really commit the buyers to any long-term period. In other words, business is good, it is not on what can be fairly termed hand-to-mouth, but it is still far from making long-term commitments. The reason is a modified uncertainty—not the uncertainty that existed a year ago—but one attributable to the new taxes which all in the trade must take cognizance of in their costs, or sooner or later find themselves in the "red." The improvement which has been experienced is not confined to sales, however, but also in collections. More customers are taking their discounts.

Association Activities

President George K. Hooper of the Philadelphia Paper and Cordage Association announces a change in the regular monthly luncheon meeting from Friday, February 22, to Friday, February 29, in the Adelphia Hotel. Norbert A. Considine, president of the Paper Trade Association of Philadelphia, has invitations to the members of the Association to be present at this luncheon meeting of the Paper and Cordage Association on February 29, in order to promote better fellowship and a better understanding between these groups.

E. K. Lay, chairman of the Entertainment Committee of the Paper and Cordage Association, has arranged for a bowling get-together meeting at the Hudson Recreation Center on Tuesday evening of this week. A big turn-out is expected, and President Hooper and immediate Past President Harry Platt will be on hand to greet all those in attendance.

Oak Terrace Country Club, Welsh Road, Ambler, Pa., has been officially designated by the Philadelphia Paper and Cordage Association as its headquarters for annual outings which heretofore have been held at the Manufacturers Country Club, Oreland, Pa.

News of the Industry

Whiting-Patterson Company, Inc., 320 North 13th street, has just mailed out to the trade additional advertising pieces in the form of attractive envelopes known as World Cities Clasp Envelopes. These envelopes are recommended for heavy-duty needs, and the reasons for using this type envelopes are epitomized in the following statement by Whiting-Patterson Company: "A test will prove that they will take any kind of a printing job in fine style and without trouble. The white heavy-duty envelope isn't practical—it soils too easily. Dark colors aren't easy to print over. Their strong shades change the color value of the inks you use.

Of all the colors in which heavy-duty envelopes are made, buff, the buff of the World Cities Clasp Envelope line, is best to work over. It doesn't fight the colors you print on it. It is a pleasing, warm, neutral tine, a splendid background for any design or color scheme, and it never clashes with the enclosures." They can be had in a varied assortment of sizes. Samples of substance 32 Jersey Creme, gummed flap, packed 100 to the box, 1M to the carton, will be submitted upon request.

R. Peel Bentley, whose headquarters are in the Public Ledger Building, is confined to his home with a broken leg, which he recently sustained in a fall while calling on his customers. His friends in the trade extend their best wishes for his speedy recovery. Mr. Bentley's home is in Ridley Park, and although incapacitated as far as making the rounds of his customers are concerned, he is conducting his business from his home.

Stevens & Thompson Staff Changes

The Stevens & Thompson Paper Company, makers of tissue and specialty board papers, announces the appointment of Grellet N. Collins, as manager of the Board Department, to take effect at once. Mr. Collins comes to the company with a wealth of experience in the paper industry, his entire business career having been spent in that field. He will divide his time between the New York office and the mills of the company in New York State.

A. E. Dubey, of the Board Sales Department of the company has resigned.

The company also announces the resignation of E. R. Clark, representative in the Cleveland territory, due to ill health. Alexander Gately, who has been with the Stevens & Thompson Paper Company for many years, is now assigned to the territory formerly covered by Mr. Clark.

International Pulp Co. Elects Officers

GOUVERNEUR, N. Y., February 3, 1936—A meeting of stockholders of the International Pulp Company was held here this week. The following officers were elected: Michael Doyle, president; William C. Gear, vice president; W. H. Stillhamer, treasurer; S. J. M. Crimlisk, secretary, and J. J. Wallace, superintendent. Directors chosen included F. N. Belding, Rockille, Tenn.; Kendall B. Castle and Michael Doyle, Rochester; William C. Geer and Robert McCarthy, Troy; W. D. Mahoney, Averill Park; S. J. McCrimlisk, Brooklyn; Charles N. Rambo and William H. Stillhamer of New York. The company also controls the Oswegatchie Light & Power Company and the officers and directors will serve in a similar capacity for that organization.

Dog Bites Paper Maker

A telegram received from a Chicago subscriber reads as follows: "Flash—At Bill Clements housewarming party in Wausau, Saturday night, George Hendrich, purchasing agent, Wausau Paper Mills, Wis., bitten by Clements' Boston bull, Peggy stop Hendrich is okey, but dog died Monday."

Ed. Note: This really does not constitute news because the dog bit Mr. Heinrich. If Mr. Heinrich had bitten the dog we would feel that we had a better story. We are sorry both for the dog and Mr. H.

Make Preliminary Report on Paper Industry

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., February 5, 1936—NRA officials have just completed their preliminary study of the paper industry. Following is a summary of findings of this preliminary report:

I. Industry Scope and Character

The manufacture of paper and paper products constitutes one of the largest industries in the United States, from the standpoint both of investment and of value of product.

The innumerable types, sizes and grades of paper manufactured result in confusion to the buyer. The steps taken toward standardization, however, have not approached a solution of the problem.

Until the latter part of the last century the principal source of raw materials was rags; today pulpwood, usually Northern evergreen, constitutes the largest source, although recently the sulphate process has permitted the use of other woods, particularly those native to the South.

The consumption of paper and paper products has increased without recession, except in periods of major depression. Productive capacity has increased steadily in the industry as a whole, even during the period 1929 - 1932, when production was receding. In recent years, however, the increase has been the result of technological developments rather than of the establishment of new plants.

Although the consumption of newsprint in the United States has increased rapidly and steadily, production has decreased simultaneously with the increase in Canadian production, financed for the most part by United States capital. In the newsprint branch domestic productive capacity has been reduced in recent years by the shifting of machines to the manufacture of other products and by the abandoning of some mills.

Exports of newsprint and other paper are inconsiderable in relation to the United States production. A large part of the domestic product crosses state borders in the form of raw materials, semi-finished and finished goods.

Prices

The large investment of capital required by the industry in relation to the volume of production results in an unusually high percentage of invariables in the cost structure, which act as a drag on the frequency of price changes.

Prices of the various grades of paper tend to have a constant relationship; a change in the price of a single grade will upset this relationship and will cause a complete disruption of prices in the entire industry.

The prices of raw materials used in paper making appear to move in sympathy with the general price level; whereas the prices of paper, while moving in that manner on major swings, of which the timing is as yet undetermined, show marked idiosyncrasies on minor movements within the cycle. These appear to be part of the price pattern peculiar to this industry.

This price pattern is believed to be the result of the same factors that cause price rigidity.

While the import situation is all important with regard to the price of newsprint, on which there is no protective tariff, it is not an important factor in the prices of grades of paper that are protected. Further, the influence of debased foreign currency in newsprint producing countries did not have an upsetting effect, because transactions were in dollars and because of the ensuing change in the valuation of United States currency.

Labor

Available statistics indicate that employment in 1929 in the sections of the paper industry covered by the study was approximately as follows: Paper and pulp, 105,000; paperboard, 32,000; newsprint, 9000.

The decrease in employment from 1929 to May, 1933, in these industries, was from 18 to 27 per cent.

During the period of the codes very substantial increases in employment were recorded.

There is no indication of a decrease in employment following the decision of the Supreme Court.

By May, 1933, hourly wages were approximately 25 per cent below the 1929 level.

Under the Code hourly wages increased to approximately the 1929 level. There was no appreciable increase in weekly wages, however, until December, 1934. Total payroll figures are not available.

Due to the pending appeals from denials of exemptions from the provisions of the amendment to the Paper and Pulp Code, the latter had little effect in increasing wages.

Financial Aspects

Although members of the paper industry have generally accepted standard methods of costing, the individual characteristics of each plant, its surroundings, its location, etc., make for differences in cost.

Available data shows that the average cost of producing newsprint in the United States and in Canada are not widely different.

There is a wide difference in costs, nevertheless, as between the various mills.

Available data from a few mills indicates that during the period May to December, 1933, the cost of producing newsprint increased about ten per cent. The major part of the increase came in the items of wood, pulp, power, and labor.

While the industry as a whole showed a profit of slightly over three per cent of sales over the eight-year period 1926-1933, the percentage of companies not making a profit has run from thirty-one to seventy-seven.

The above indicates a vast difference in the relative profitability of individual companies.

Industrial Administration and Control

Since 1878 the paper industry has been characterized by very active trade associations, dealing with practically all phases of industrial problems.

The Executive Authority of the American Paper and Pulp Association, the Advisory Committee of the Newsprint Association, and the Executive Committee of the National Paperboard Association were designated as the administrative agencies for their respective codes.

No budgets were approved for these industries by the NRA, but the expenses of the administrative agencies were borne by associations. Many activities of the administrative agencies were combined with association activities.

The paper and pulp, newsprint and paperboard industries operated with a significantly small number of compliance cases.

On some occasions the Paper Industry Authority exercised powers beyond those provided for in the Code.

The Newsprint Code Authority, after failing to get favorable action under Section 3(e) of the Recovery Act, presented a plan of stabilization for the industry to the NRA. This was not approved.

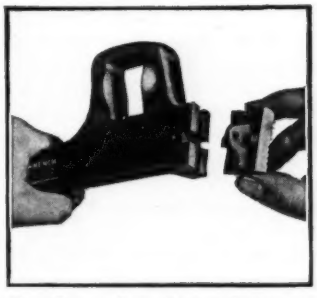
WALCO TAKES A···

MODERN GRIP ON MAINTENANCE

This new Walco wrench with the cross-locked, renewable jaw is a truly modern tool. The life of the wrench can be prolonged indefinitely by simply renewing the specially hardened lower jaw—a few minutes is all the time required. In addition to being the strongest pipe wrench made Walco now is the longest lasting.

All parts of drop-forged steel with integral forged housings . . . all parts heat-treated . . . rust-proof finish . . . makes the Walco immune to abuse. A new type spring makes possible quick replacement without use of tools.

Walco takes a modern grip—by far the cheapest in the long run.



It takes only a few minutes to cross-lock the renewable lower jaw in place, secure against loosening.

WALWORTH

VALVES FITTINGS and TOOLS
Backed by 93 Years' Service

WALWORTH COMPANY
60 EAST 42nd STREET, NEW YORK

DISTRIBUTORS IN PRINCIPAL CITIES THROUGHOUT THE WORLD

In the paperboard industry efforts were made to establish a plan for industrial stabilization through restrictions on productive capacity and control of the waste paper markets.

Another preliminary report dealing with the newsprint industry and foreign trade is as follows:

Changes in World Production, 1929-1933

From 1929 to 1932, the world production of newsprint decreased 14.1 per cent, due chiefly to a sharp decline in Canada, the United States, and Germany. Production in Sweden and Japan during the same period declined a relatively small amount. On the other hand, production showed a remarkable increase in England, Finland and France, and substantial increases occurred in Newfoundland and Norway. However, the countries showing increases constituted only 20.6 per cent of world production in 1929, and 28.5 per cent in 1932. The United States and Canada, which together produced in 1929, 56.4 per cent, and in 1932, 46.6 per cent of the world production, lost during the period 2.9 per cent and 6.9 per cent, respectively.

The Industry in the United States

The newsprint industry in the United States in 1934 was composed of twenty-five companies operating principally in the States of Maine, New York, Oregon, Minnesota, Wisconsin, and Washington, with an estimated aggregate capital investment of about 300 million dollars. In June, 1933, it employed 6,560 persons, with an annual payroll of $7,150,000. In 1929 production was 1,409,000 short tons; while imports, mostly from Canada, were 2,423,000 short tons. Domestic consumption in 1933 approximated 2,729,000 short tons, of which the United States produced 946,000 short tons, and of which 1,794,000 short tons were imported principally from Canada.

The Industry in Canada

In 1934, there were approximately 24 Canadian companies engaged in the manufacture of newsprint. Production in 1929 was 2,729,000 short tons, of which 2,195,000 short tons or 80.4 per cent, were exported to the United States. In 1933 Canada produced 2,017,000 short tons, of which 1,545,000 short tons, or 76.6 per cent, were exported to the United States. Although no official figures are available, the Department of Commerce has estimated that in 1930 over 400 million dollars of United States capital was invested in the Canadian paper and pulp industry as a whole. This is over 50 per cent of the 794 million dollar capital investment in that industry.

United States Consumption

In 1929, the United States consumed about 52 per cent, or 3,813,000 short tons, of the total world production of 7,308,000 short tons; and in 1933, it consumed 2,831,000 short tons, or 45 per cent of a world production of 6,275,000 short tons.

In 1929, the domestic production constituted 36.7 per cent of the domestic consumption, whereas imports were 63.3 per cent. Of this latter, Canada and Newfoundland supplied 2,327,000 short tons, or 96 per cent. Domestic production in 1933 was 34.7 per cent of total consumption, while imports rose relatively to 65.3 per cent, with Canada and Newfoundland supplying 91.4 per cent.

The consumption of newsprint rose steadily to 1929, when it reached peak of 3,813,000 short tons. It then declined pogressively to a total of 2,711,000 short tons in 1933—a drop of 29 per cent during that period. End of the year stocks at the mills, at publishers and in transit in 1930 were 3,399,000 short tons. For 1933 the same figures were 2,567,000 short tons—a reduction of 24.5 per cent.

For 1928, the latest year for which data are available, the distribution of newsprint consumption among states was: New York, 22 per cent; Illinois, 12 per cent; Pennsylvania, 9 per cent; Massachusetts, 6 per cent; California, 6 per cent; Ohio, 5 per cent; Michigan, 5 per cent; Missouri, 4 per cent; Tennessee, 3 per cent; Minnesota, 2 per cent; Indiana, 2 per cent; Texas, 2 per cent. The consumption in this group of 12 states amounted to over 75 per cent of the total consumption in the United States. Although the total consumption of newsprint in 1933 was less than that of 1928, it is probable that the percentage relationships have not greatly changed.

United States Production and Trade

Exports of newsprint from the United States are negligible, amounting to 19,000 short tons in 1929, and to only 11,000 short tons in 1933.

Production in the United States since 1926 has declined each year. The total decline from 1926 to 1933 was 44 per cent. Imports, on the other hand, increased approximately 30 per cent from 1926 to 1929. Thereafter, they declined, and in 1932 and 1933 were about 3 per cent less than imports in 1926. Nevertheless, with the exception of the year 1932, the ratio of imports to domestic production, based on annual figures, increased steadily throughout the period 1926 to 1933. It rose from 110 per cent in 1926 to 175 per cent in 1929, to 178 per cent in 1932, and to 190 per cent in 1933.

Standard newsprint is imported into the United States free of duty, under the Tariff Act of 1930. In recent years Canada has supplied 85 to 90 per cent of the total imports. From 1929 to 1933, there was a slight increase in the relatively small percentages coming from Sweden, Finland, and Germany. Based on 1929 statistics, about 90 per cent of the newsprint produced in Canada was exported, and 80 per cent of this was shipped to the United States. Eighteen per cent of the newsprint exported from Sweden and 15 per cent of the exports from Finland were also shipped to this country.

Effect of the Newsprint Code

The domestic Newsprint Industry's Code was approved November 17, 1933. Data submitted by six individual companies indicated that the total costs of operations increased approximately 22 per cent in the period between June-November, 1933, and December, 1933, through May, 1934—before and during code operation. It was likewise indicated that the percentage of labor to total costs was 12.95 before the code, and 13.6 after the code became effective. Over the same interval employment was shown to have increased 13 per cent; average hours per week to have decreased 12 per cent; the average weekly wage to have increased about 1 per cent; and the average hourly wage to have increased 1.5 per cent.

Important Competitive Factors

Of particular significance in the competitive relationship between the United States and Canadian newsprint industries has been the rapid expansion in the latter country. This has been mainly due to the fact, that extensive tracts of timber and an abundance of advantageous water power sites have been available to producers in Canada, under Government lease and at a comparatively low capital cost. The situation in the United States, on the other hand, has been that substantially all sites affording sufficient supplies of timber and water power have been available only at a capital cost considerably greater than in Canada.

From 1926 through the first three-quarters of 1932, newsprint prices fell less than the general wholesale price. After the first quarter of 1933, however, newsprint did not share in the general rise in wholesale prices. The

average unit values of imports were only slightly below domestic prices, and the addition of transportation and selling costs would apparently have brought the net price to the consumer up to or above the level of the domestic price. While the base price of newsprint in the United States declined 65 per cent from 1929 to 1935, the average unit value of imports over the same interval declined less than 42 per cent.

The competitive position of the domestic newsprint industry, insofar as it was affected by the currency situation, was substantially better after the Code went into effect than it was from September, 1931, to April, 1933. The dollar value of the currencies of Canada, Sweden, and Finland averaged about 12 per cent, 30 per cent, and 40 per cent, respectively, below the par for the year 1932. Later, in 1933, however, the currencies of Canada and Sweden returned almost to par, and that of Finland to within 10 per cent of par.

District of Columbia to Reorganize

The District of Columbia Paper Manufacturing Company, Washington, D. C., has made application to reorganize under Federal regulations. In explaining the reasons for this move, G. L. Nicolson, president of the company states that "like many other paper manufacturing firms, our business suffered from lack of buying during the years following 1929 and 1930, and while since 1933, our situation has improved steadily due to a well-planned and progressive policy, we feel, however, that it would be to the best interest of all concerned, and put us in a much sounder position, to reorganize under provisions 77-B. With this in mind, we filed application which the Court signed on Friday, January 31.

"Since our First Mortgage Bonds mature in fifteen months, the plan is to issue to the bond holders, 100 per cent face value bonds at a lower interest rate. Preferred stock holders are taking common stock in lieu of preferred.

"The indebtedness to the bank has been placed on a five-year loan at a very satisfactory and lower rate of interest.

"Other creditors, including the company's current trade accounts, will not be effected by the plan. Accounts now owing these creditors, or hereafter becoming due them, will be paid in the normal course of business, as though there had been no reorganization or readjustment of debt.

"The result of the reorganization will put the company in a current position of over four to one assets to liabilities. When the reorganization plan is available, copy will be sent you.

"The changes in our financial structure in no way effect our sales or promotion activities. The merchandising plans for our different papers have not been changed, except that our activities have been increased.

"Officers under the reorganization plan will be as follows: G. L. Nicolson, President; D. A. Smith, Vice-President; W. W. Langtry, Vice-President; L. D. Nicolson, Secretary-Treasuer."

Arch F. Barber Dead

Arch F. Barber, vice-president of Tobey Fine Papers, Inc., St. Louis, Mo., passed away Saturday, January 18, after an extended illness.

Prior to the organization of the Tobey Company, Mr. Barber was connected with the old Seaman organization and travelled in the State of Kansas, returning to Saint Louis in 1924.

Mr. Barber was a veteran of the World War, having served over-seas, and a member of the Scottish Rite. He had a wide acquaintance among the paper industry.

Jacob Kindleberger Made Chairman

KALAMAZOO, Mich., February 3, 1936—Creating new offices and making the first major change in titles in many years, the stockholders and directors of KVP on January 30 moved Jacob Kindleberger up into the new office of chairman of the board, and R. A. Hayward to the office of president, says the *Parchment News*. Alfred Southon became 1st vice president in charge of sales and a member of the board of directors. Harold Jones was elected 3rd vice president. James Greenlee of the Chicago office remains 2nd vice president. C. S. Campbell and T. W. Peck were re-elected treasurer and secretary respectively and W. R. Hess was re-elected assistant secretary. A 30 per cent stock dividend was also declared.

In becoming chairman of the board, Mr. Kindleberger realizes the completion of a plan many years in the making. It has always been his wish to have men trained in positions of responsibility, ready to take over the reins in such a manner that the business could continue without interruption in case of the sudden passing of any one individual. Mr. Hayward steps into the office of president with a thorough background of paper mill experience, twelve years of which have been with KVP, carrying out its plans of progress and expansion. Mr. Southon's elevation to first vice presidency and a place on the board of directors is a well earned reward for almost twenty-five years of unusual service with the company. Mr. Jones has been with KVP nearly eighteen years and has risen from a position as stenographer to sales manager of the important waxed paper division.

It is particularly gratifying to all KVP employees that these promotions should come to men within the company whose service and ideals have been such as to merit these new responsibilities. The officers and board of directors are now as follows: Chairman of the Board, Jacob Kindleberger; President and General Manager, R. A. Hayward; 1st Vice President and General Sales Manager, Alfred Southon; 2nd Vice President, J. A. Greenlee; 3rd Vice President, H. H. Jones; Treasurer, C. S. Campbell; Secretary and Assistant Treasurer, T. W. Peck; Assistant Secretary, W. R. Hess. Directors: C. S. Campbell, A. B. Connable, R. A. Hayward, W. O. Jones, W. E. Kidder, J. Kindleberger, W. J. Lawrence, F. Mosteller, A. B. Read, A. Southon, C. H. Stearns.

Although there is considerable change in titles, Mr. Kindleberger will continue actively in the business, and will be, to use his own words, "the official watch dog." As always, he will be accessible to any man or woman in the mill for counsel and guidance.

Marcus A. Hanna Dead

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., February 3, 1936—Marcus A. Hanna, 2nd, grandson of the late Senator Mark Hanna of Ohio, who died recently in Cleveland, Ohio, was a former resident of Watertown. He was 47 years old. He had been ill for several months.

He and his brother, Carl H. Hanna, came here in 1916, taking over the controlling interest in the Remington Pulp and Paper Company with mills at Norfolk, Norwood and Raymondsville, and formed the Hanna Paper Company.

M. A. Hanna served as head of that company as well as head of the Champion Paper Company of Carthage. The Hanna brothers resided here until 1921, when on the death of their father, they returned to Cleveland. They disposed of their paper mills to the St. Regis interests. Mr. Hanna leaves his wife and seven children. His father was the late Daniel R. Hanna, Cleveland industrialist.

Revised Schedules of Meetings for Paper Week

Waldorf-Astoria Hotel, New York, February 17-21, 1936

The following is the revised preliminary schedules of meetings for the fifty-ninth annual convention of the American Paper and Pulp Association and affiliated organizations to be held at the Waldorf-Astoria Hotel, New York, February 17-21, 1936:

Monday, February 17, 1936

A. M.

9:00 American Waxed Paper Association, Executive Committee. Crane Room U.
9:30 American Paper and Pulp Association, Executive Committee. Carpenter Salon.
10:00 Glassine and Greaseproof Manufacturers Association Preliminary Meeting. Pillement GH.
10:00 Roll Toilet Tissue Association. 4 J, K.
10:00 Sulphite Paper Manufacturers Association, Bleached Papers Group. Le Perroquet X.
10:00 TAPPI. General Session. Astor Gallery.
10:00 Waterproof Paper Manufacturers Association, Executive Committee. Crane Room V.
10:00 Writing Paper Manufacturers Association, Executive Committee. Club Room, Roof.

P. M.

12:30 American Paper and Pulp Association, Executive Committee-Luncheon. Carpenter White.
12:30 Paper Makers Advertising Club, Luncheon. Le Perroquet Y.
1:00 American Waxed Paper Association—Tissue and Household Rolls Group. Luncheon. Crane Room U
1:00 Blotting Paper Manufacturers Association, Annual Meeting. Suite Parlor.
1:00 Sulphite Paper Manufacturers Association, M. G. Sulphite (other than Waxing). Luncheon. Le Perroquet W.
1:30 American Paper and Pulp Association, Board of Governors. Carpenter Salon.
2:00 TAPPI—Alkaline Pulping. Astor Gallery.
2:00 TAPPI—Materials of Construction. East Foyer.
2:00 Waterproof Paper Manufacturers Association. Executive Committee. Crane Room V.
2:30 American Paper and Pulp Association, Open Meeting. Jade Room.
2:30 Wrapping Tissue Association. 4 J, K.
3:00 Salesmen's Association of the Paper Industry, Executive Committee. 4 D.
4:00 American Waxed Paper Association, Delicatessen Group. Crane Room U.
4:00 Cover Paper Manufacturers Association, Executive Committee. Club Room, Roof.
6:00 Sulphite Paper Manufacturers Association, Board of Governors, Dinner. Pillement GH.
7:00 Association of Manufacturers and Converters of Tissue, Board of Governors. 4 J, K.

Tuesday, February 18, 1936

A. M.

9:30 TAPPI—Stuff Preparation. Astor Gallery.
9:30 TAPPI—Coated Paper. East Foyer.
10:00 American Waxed Paper Association, General Meeting. Jansen Suite.
10:00 Book Paper Manufacturers Association, Executive Committee. Carpenter Salon.
10:00 Cardboard Manufacturers Association, Executive Committee. Crane Room U.
10:00 Groundwood Paper Manufacturers Association, Committeee Meetings. 4 N, 4 R.
10:00 Kraft Paper Association, Executive Committee—Office of Stevenson, Jordan & Harrison.
10:00 Salesmen's Assn. of the Paper Industry, Annual Meeting. Carpenter White.
10:00 Specialty Paper and Board Affiliates, Executive Committee. Crane Room V.
10.00 Sulphite Paper Mfrs. Assn., Unbleached Papers Group. Le Perroquet W.
10:00 Waterproof Paper Manufacturers Association, General Meeting. Le Perroquet Y.
10.00 Writing Paper Manufacturers Association. Club Room, Roof.
10:30 Association of Manufacturers and Converters of Tissue, General Meeting. Le Perroquet X.

P. M.

12:15 Salesmen's Association of the Paper Industry—Luncheon. Grand Ball Room.
1:00 American Waxed Paper Association, Bread Wrapper Ground—Luncheon. Jansen Suite.
1:00 Bristol Board Mfrs. Group, Executive Committee—Luncheon. Pillement F.
1:00 Sulphite Paper Mfrs. Association, Manila Papers Group—Luncheon. Carpenter White.
2:00 American Waxed Paper Association, Bread Wrapped Group. Jansen Suite.
2:00 Groundwood Paper Mfrs. Association, Board of Governors. Crane Room U.
2:00 Kraft Paper Association, Executive Committee—Office of Stevenson, Jordan & Harrison.
2:00 Specialty Paper and Board Affiliates, General Meeting. 4 M.
2:00 TAPPI—Stuff Preparation and Mechanical Pulping. Astor Gallery.
2:00 TAPPI—Coated Paper. East Foyer.
2:00 Waterproof Paper Manufacturers Association, General Meeting. Le Perroquet Y.
2:30 Book Paper Manufacturers Association, Executive Committee. Carpenter Salon.
2:30 Bristol Board Manufacturers Group, General Meeting. Pillement GH.
2:30 Cover Paper Manufacturers Association. Club Room, Roof.
2:30 Sulphite Paper Manufacturers Association, Annual Meeting. Le Perroquet W.
3:00 Comparative Reporting Service, Management Aspects. 4 J, K, L.
3:00 U. S. Pulp Producers Association, Annual Meeting. Le Perroquet XX.
5:00 Bristol Board Manufacturers Group, New Executive Committee. Pillement GH.
6:30 Glassine and Greaseproof Manufacturers Association, Executive Committee. Dinner. Crane Room V.

Wednesday, February 19, 1936

A. M.

9:30 TAPPI—Heat and Power. Astor Gallery.
9:30 TAPPI—Paper Testing. East Foyer.
10:00 Association of News Print Manufacturers of the U. S. Le Perroquet Y.
10:00 Book Paper Manufacturers Association, Executive Committee. Carpenter Salon.
10:00 Cardboard Manufacturers Association, General Meeting. 4 N, P.
10:00 Comparative Reporting Service—Discussion of Services. Le Perroquet X.

10:00 Glassine and Greaseproof Manufacturers Association. Pillement GH.
10:00 Groundwood Paper Manufacturers Association, General Meeting. Le Perroquet W.
10:00 Gummed Industries Association, Executive Committee. 4 D.
10:00 Kraft Paper Association, Annual Meeting. Jansen Suite.
10:00 Paper Shipping Sack Manufacturers Association—Hotel Biltmore.
10:00 Specialty Paper and Board Affiliates, Group Meeting. 4 R.
10:00 Waxing Tissue Association. Crane Room U.
10:00 Writing Paper Manufacturers Association, Rag Content Paper Group. Club Room, Roof.
11:00 Binders Board Manufacturers Association. Crane Room V.
11:30 Cardboard Manufacturers Association, Group Meeting. 4 N, P.

P. M.
1:00 Binders Board Manufacturers Association, Luncheon. Crane Room V.
1:00 Comparative Reporting Service—Luncheon. Carpenter White.
1:00 Glassine and Greaseproof Manufacturers Association—Luncheon. Pillement F.
1:00 Kraft Paper Association, Luncheon. Jansen Suite.
2:00 TAPPI—Color, Packaging and Paper Uses. Astor Gallery.
2:00 TAPPI—Paper and Pulp Testing. East Foyer.
2:00 Association of News Print Manufacturers of the U. S. Le Perroquet Y.
2:00 Book Paper Manufacturers Association, Executive Committee. Carpenter Salon.
2:00 Cardboard Manufacturers Association, Group Meeting. 4 N.
2:00 Glassine and Greaseproof Manufacturers Association. Pillement GH.
2:00 Groundwood Paper Manufacturers Association, General Meeting. Le Perroquet W.
2:00 Gummed Industries Association, Executive Committee. 4 D.
2:00 Kraft Paper Association, Annual Meeting. Jansen Suite.
2:00 Semi-Crepe Paper for Napkins Group. Crane Room U.
2:00 Specialty Paper and Board Affiliates, Group Meeting. 4 R.
2:30 Comparative Reporting Service—Committee Meeting. 4 M.
2:30 Writing Paper Manufacturers Association, Sulphite Bond Group. Club Room, Roof.
3:30 American Sulphate Pulp and Board Association. Jansen Suite.
4:00 Cardboard Manufacturers Association, Group Meeting. 4 P.

Thursday, February 20, 1936

A. M.
9:30 TAPPI—Fundamental Research. Astor Gallery.
9:30 TAPPI—Heat and Power. East Foyer.
10:00 Book Paper Manufacturers Association, General Meeting. Jansen Suite.
10:00 Cardboard Manufacturers Association, Group Meeting. Carpenter Salon.
10:00 Gummed Industries Association, General Meeting. Le Perroquet Y.
10:00 Specialty Paper and Board Affiliates, Group Meeting. 4 N.
10:00 Vegetable Parchment Manufacturers Association. Crane Room V.
10:00 Writing Paper Manufacturers Association, Blue Print Group. Le Perroquet W.
10:00 Writing Paper Manufacturers Association, Papeterie Group. Le Perroquet X.

P. M.
1:00 Book Paper Manufacturers Association, Luncheon. Jansen Suite.
1:00 Vegetable Parchment Manufacturers Association, Luncheon. Crane Room V.
1:30 TAPPI—Annual Luncheon. Grand Ball Room.
2:00 American Pulpwood Association. Le Perroquet X.
2:00 Cardboard Manufacturers Association, Group Meeting. Carpenter Salon.
2:00 Gummed Industries Association, General Meeting. Le Perroquet Y.
2:00 Specialty Paper and Board Affiliates, Group Meeting. 4 N, P.
2:00 Vegetable Parchment Manufacturers Association. Crane Room V.
2:00 Writing Paper Manufacturers Association, Thin Paper Group. Le Perroquet W.
7:30 Inter-Society Color Council. Astor Gallery.

Friday, February 21, 1936

A. M.
10:00 Book Paper Manufacturers Association, General Meeting. Jansen Suite.
10:00 Specialty Paper and Board Affiliates, Group Meeting. 4 N, P

P. M.
2:00 Book Paper Manufacturers Association, General Meeting. Jansen Suite.
2:00 Specialty Paper and Board Affiliates, Group Meeting. 4 N, P.

TAPPI to Hear Famous Plant Physiologist

An outstanding feature of the annual meeting of the Technical Association of the Pulp and Paper Industry on Thursday morning at the Waldorf-Astoria Hotel, New York, February 20, will be the lecture on "The Origin and Development of Cultivated Plants," by Dr. A. B. Stout of the New York Botanical Garden and Columbia University.

Dr. Stout has succeeded to the prestige of being the leader in the field of plant hybridization, a position formerly held by the World's famous Luther Burbank. Like Dr. Burbank, he has been able to produce many new flowering plants and was in charge of the work carried on by the Oxford Paper Company in the development of rapid growth hybrid poplar trees.

Dr. Stout's lecture will be bountifully illustrated by colored slides and the speaker will point out the practical application of his findings.

Pulp and Paper Department New York State College of Forestry to Dine

The annual dinner of the Pulp and Paper Alumni of the New York State College of Forestry will be held as usual on Wednesday evening, February 19, at 6:30, during the week of the Annual Convention of TAPPI. The dinner will take place at the Sacher Restaurant, 301 Madison avenue, New York City.

As was the case last year, there will be no formal speeches or program, and the meeting will be in the nature of an informal get-together and a renewal of old friendships.

Arrangements are being made by a committee whose chairman is: William R. Willets, '25, Paper Development Laboratory, Titanium Pigment Company, Inc., 105 York street, Brooklyn, N. Y.

CANADIAN PULP AND PAPER MEN MEET AT MONTREAL

(Continued from page 11)

which although small in tonnage has been of assistance in enlarging the volume of output.

The production of wrapping papers and paperboards also showed increase during the year, which was undoubtedly a reflection of the greater movement of general merchandise into consumption. New uses are being developed for board and demand has been good. It is noted with satisfaction that export shipments of board were considerably greater than in 1934 and the additional outlet thus gained has been beneficial to the board mills. Heavier shipments were made to Great Britain, Australia and South Africa, which can be attributed to the operation of the Empire Trade Agreements and to the superior quality of Canadian boards.

Imports of Paper

Importations of paper from abroad were slightly greater than in the preceding year and still provide severe competition for Canadian mills. Under the trade agreement with the United States, reductions were made in the Canadian tariff on most grades of paper and the effect of this will probably become more marked as time goes on. It must always be borne in mind that the Canadian market is not large and that Canadian mills suffer from the disadvantages of a small miscellaneous market.

It is a matter of congratulation that the difficulties regarding tariffs between Canada and Japan which adversely affected shipments of pulp and paper to that country, particularly from the West Coast mills, have been adjusted and shipments can be resumed without hindrance.

The various Sections and Committees of the Association report an active year, and over one hundred meetings have been held in the Institute during the past twelve months to deal with matters affecting the industry in its various branches. An effort has been made to form a Mechanical Pulp Section and several meetings have been held for this purpose; it is anticipated that these efforts will meet with success during the coming year.

The Technical Section reports a year of good progress. Membership in the Section has been well maintained, in spite of the difficult times, and there has been exhibited a keen interest in the work of the Section and in the work being carried on in the Research Institute. The members of the various committees have given freely of their time and knowledge for the benefit of the industry at large and on behalf of the Association as a whole I thank them for their valuable contributions to progress in the industry. The formation of the Ottawa Valley Branch of the Section is evidence of the interest taken in the work of the Technical Section and in technical matters related to the industry. Such a movement is bound to benefit its members and the member organizations with which they are connected; the Section is to be warmly congratulated on the formation of the Ottawa Valley Branch.

Importance of Research Work

The work being done in the Research Institute is more fully dealt with in the reports presented by the Joint Administrative Committee, the Division of Cellulose and Industrial Chemistry and by the director of the Forest Products Laboratories. Again I would urge upon executives and technical men in the industry that they make themselves better acquainted with the facilities available at the Institute. Some of our members recognize the value of this work and are benefitting from it, others have not yet realized the possibilities. The appointment of a Technical Adviser to the Joint Administrative Committee was made to co-ordinate the various research activities being carried on and has already had valuable results. A good deal of testing and investigative work has been carried on for member companies during the year in addition to work on research problems which is reported at meetings of the Section. Through the co-operation of McGill University and the Forest Products Laboratories of Canada, much valuable work is being done at a reasonable cost to the industry, and the work is heartily endorsed by the Technical Section whose members are keenly aware of its value. I cannot too strongly urge that this work be supported to the fullest possible extent so that the maximum of service may be rendered to the industry.

Good Work by the Sections

The Woodlands Section reports an active year and an increased membership. Serving, as it does, the interests of all those engaged in woods operations this Section renders a useful service to the whole industry. Its members are active and enthusiastic, co-operating fully in measures looking to a solution of problems affecting this branch of the industry. When we consider that woods operations are the basis of the industry we should feel grateful that the members of this Section devote so much of their time and energy to the working out of problems dealing with the efficient and economical handling of the raw material upon which our industry is based.

During the past two years there has been brought about a closer contact between the Technical and the Woodlands Sections in an endeavour to clarify and study marginal problems, looking to a more intimate co-operation between woods and mill operations. At the Annual Meeting one of the sessions is devoted to discussions on joint problems which will undoubtedly yield valuable results both to woods and mill operators.

The Tariff Department again records an active year and has rendered good service to individual members and to the industry as a whole. This Department is equipped to render assistance in matters of Customs and Tariffs, excise tax, valuations, drawback claims, the Marking Act, questions of dumping and so on; our members are again invited to make use of the efficient facilities that are available through the Association. Members feeling the necessity of initiating any action of this nature are urged to take them up in the first instance with the Secretary of the Association so that their interests and the interests of the industry as a whole may be best served by a comprehensive presentation of the case to the proper authorities.

Good Financial Position

The Financial Report will be submitted at this meeting by the secretary-treasurer and it will be seen that the Association is in a good financial position. The result for the year shows a small surplus and the Association was able to take care of the Sinking Fund, bonds to the value of $17,500 having been redeemed at a considerable saving thanks to the generosity of one of our company members. There have been no changes in the list of members and practically all the pulp and paper

companies in the Dominion are now members of the Association.

I think we can look back upon the past year with some degree of satisfaction while not losing sight of the problems that still confront us and the solution of which challenges our best efforts and intelligence. The year we are entering gives promise of better things. There are signs of improvement not only in our own country but in other countries which purchase our products. Conditions are gradually becoming more stabilised and economic nationalism is giving way, if very slowly, to a realization that no country can live to itself alone. All indications are that we can look for a better and more prosperous year in 1936 than we experienced in 1935 and I trust that our hopes will be realized to the full.

Reports of the Sections

As is customary, the various Sections presented detailed reports of activities and conditions during the past year. The following is a synopsis of these reports:

The Newsprint Industry in 1935

R. K. Martin, Secretary of the Newsprint Export Manufacturers Association of Canada reported as follows:

Record production and shipments, gradually improving marketing conditions and the announcement of a $1.00 price increase for 1936—the first increase since 1923—marked the year just past. The Canadian industry thus faces the coming twelve months in a statistically stronger position than for many years past. On the other hand, the industry remains afflicted by its fundamental weaknesses of a vulnerable contract system, an unbalanced distribution of tonnage and unsound competitive practices. These weaknesses are reflected in the continuance of newsprint prices at almost the lowest levels in thirty years, although the world trend now appears to have turned upward.

Production in 1935 set a new record at 2,752,735 short tons as against 2,599,578 tons in 1934 and 2,728,827 tons in 1929, the previous peak year. The recovery from the depression year 1932 amounted to 833,752 tons or 43.4 per cent.

Production improved only slightly over 1934 in the first six months of the year, being 1,284,894 tons against 1,263,284. This was largely due to the abnormal increase in publishers' stocks at the end of 1934 when a price increase for 1935 seemed imminent. During the last half of 1935, however, there was a marked increase in the demand for Canadian paper throughout the world. This was particularly true of the last two months. Production from June to December inclusive, was 1,467,841 tons or 10 per cent above the 1,336,294 tons of the corresponding 1934 period and more than 3 per cent above the 1,416,551 tons produced during the last half of 1929.

It is encouraging to note that this increased production in the last half of the year was not caused by increases in stocks but appeared to go directly into consumption. Total Canadian and U. S. mill stocks at the end of the year were 40,000 tons against 42,000 tons a year ago while publishers' stocks at the end of November were 265,000 or 33 days' supply at the then rate of consumption against 280,000 tons or 38 days' supply at the end of November, 1934.

Sharp Increase in Overseas Shipment

The most notable feature of Canada's sales of newsprint was the further sharp increase in overseas shipments which totalled 526,523 tons (19.1 per cent of total shipments) as against the previous record of 427,525 tons (16.5 per cent) in 1934 and 339,000 tons (11.9 per cent) in 1929. Nearly all markets, except Argentina, increased their purchases of Canadian paper but the most spectacular rises occurred in the British Isles, up nearly 50 per cent from 1934, New Zealand, South Africa, Japan and certain parts of Central and South America. Exchange conditions continued to make overseas sales risky and difficult.

According to News Print Service Bureau ratings the Canadian industry operated at 71.2 per cent of capacity during 1935 as against 67.0 per cent in 1934. The operating ratio was the highest since 1929 although still considerably below the high percentages obtaining during the period 1922 to 1928. However, the growth in consumption and the continuation of low prices is undoubtedly correcting the supply and demand position of newsprint throughout the world. During 1935 considerable further amounts of American capacity turned from newsprint production of other grades of paper making, more than offsetting increased capacity in Scandinavia and Japan. Recently it was announced that a 100,000 ton mill is planned to go into production in Quebec by the middle of 1938 and further building is either under way or projected in Russia, Finland, Holland, Japan and Australia, but in spite of these actual potential increases in world capacity there is no doubt that world consumption is increasing very much faster than production, and indications are that this trend will be continued throughout 1936.

In brief, economic factors of supply and demand are clearly working toward the industry's improvement. Operating against this are the peculiar weaknesses already mentioned by which the newsprint industry is vulnerable to pressure by large buyers.

Chemical Pulp Section

F. G. Robinson, chairman, reporting for this Section, said that the substantial improvement in business conditions in North America in 1935 justified a moderately cheerful outlook for 1936. Demand for sulphite pulp was greater than in 1934. This brought about a better supply-demand relationship, but excess capacity in the world's sulphite pulp industry persisted and this, together with a regrettable over-anxiety by some producers to secure business, prevented a more satisfactory price level. Nevertheless, the industry was in a stronger statistical position than it was a year ago and further improvement in demand was indicated.

The activities of the Executive Authority of the Pulp Division of the United States Paper and Pulp Industry terminated with the invalidation of the National Industrial Recovery Act. The function of securing cooperation within the United States industry was assumed by the United States Producers' Association, with whom friendly relations were maintained.

Exports of Canadian bleached sulphite in 1935 totalled 286,083 tons, as compared with 252,999 tons in 1934.

Exports of unbleached sulphite in 1935 totalled 92,477 tons, as compared with 95,315 tons in 1934.

Ground Wood Pulp

Production of ground wood pulp in 1935 showed an increase commensurate with the increase in the production of newsprint. Exports of ground wood pulp for the nine months of the fiscal year to December, 1935, amounted to 2,067,496 cwt., valued at $2,155,559, as compared with 1,998,630 cwt., valued at $2,278,426 for the corresponding period in 1934. These figures reveal the unsatisfactory nature of prices during 1935.

Coated Paper Section

R. Pierce Reid, chairman, reported for the Section that

the production of coated paper for the eleven months ending November showed an increase of approximately 1½ per cent over the previous year. The production however, in 1934 was approximately 15 per cent greater than 1933.

With gradually improving conditions, manufacturers undoubtedly would appropriate more funds for advertising materials to stimulate their sales efforts and this should have the tendency to decrease the use of cheaper grades of paper as a substitute for coated paper.

Light Weight Sulphite Section

A. L. Carruthers, chairman, reported that manufacturers of light weight sulphite papers were still suffering from lack of tonnage, and an additional mill had entered the field, making a total of seven now manufacturing these grades. The prices, however, had been somewhat more stable than previously, and grade standards had been established which had improved the situation. The outlook for 1936 was that the present volume of output could be satisfactorily maintained, and inasmuch as the sulphite paper manufacturers had never kept their prices up to the limit permitted by the tariff, they did not anticipate any radical interference as a result of the new trade agreement with the United States.

Tissue Paper Section

Throughout 1935 there was a slight improvement in the tissue business, according to the report of George Carruthers, chairman of the Section. The number of mills was the same as last year, namely eight. Nearly all had made improvements in plant, and the Garden City Power Company had a new mill under construction which was expected to be in operation at an early date. The indications were for future improvements in the business in 1936.

Wrapping Paper Section

J. O. Chenevert, chairman, reported for the Section that consumption of wrapping paper was approximately the same as in 1934. During the year another mill had entered into the production of wrappings, in addition to the one which began the manufacture of wrapping paper in 1934. The result was that as the consumption of wrapping paper in Canada was already far below the capacity of the domestic mills, the increased capacity has still further intensified competition.

Board Section

J. W. Fitzgerald, chairman, reported that much constructive work had been done towards the standardization of grades and the revision of gauge lists, and it was hoped to bring this work to a completion during 1936. There was still a considerable excess of capacity over production, but the picture looked brighter each succeeding year, due to improved conditions at home, coupled with a substantial increase in export trade.

Quoting figures for the first 11 months in 1935 and 1934, he said the total consumption of the home market in 1935 amounted to 204,348 tons as compared with 189,675 tons in 1934. Of these totals the imports from other countries accounted for 5,342 tons in 1935 as against 4,922 tons in 1934. The exports to other countries in 1935 amounted to 43,947 tons as compared with 32,098 tons in 1934. Thus the total shipments of Canadian board mills in 1935 amounted to 242,953 tons as compared with 216,851 tons in 1934, or an increase of 12 per cent.

An interesting note is that the import of finished boxes in 1935 was $249,038 as compared with $257,348 for 1934. The production total of 242,953 tons in 1935 exceeded the production of the year 1929 by 32⅔ per cent. This is accounted for by a decrease of 24,000 tons in board imports, a decrease in the importation of finished boxes to the value of $1,100,000, as well as to new uses for board and new methods of packaging such commodities as soft drinks, beer and cigarette boxes. There was also a substantial increase in the export of board due to the superior quality of the Canadian product. The Ottawa Agreements had also helped exports within the Empire, and regular shipments were now moving to Australia, which market was practically closed to Canada for many years. The board industry entered the new year with a feeling of optimism and a spirit of co-operation which should surmount all obstacles.

Book and Writing Section

Healthy progress was made in 1935 by the book and writing paper industry, according to A. J. Jewett, chairman of the Section, though the improvement in tonnage fell somewhat short of their ideas of what would be perfectly satisfactory. The recent trade agreement with the United States was held to be of major importance to the industry. In the re-admission free of duty of American magazines they stood to lose two ways: first, by reason of the not improbable loss of some of those publications which commenced the printing of Canadian issues in Canada subsequent to the application of a tariff; and, second, Canadian publishers lost circulation because of the cheaper selling price of competitive American periodicals. The direct reduction in duties, as applied to the industry's products, while not in most cases great, nevertheless tended to increase their difficulties because of the extremely low prices prevailing in the United States market, where of late years the manufacture of fine papers had not been a particularly profitable venture. On the other hand, should general business in Canada improve by reason of this Agreement, the members of the Section would undoubtedly participate therein.

Technical Section

W. S. Kidd, chairman, reporting for this Section, said that sound progress had been made in the past year both in the extension of the constructive functions of the Section and in the maintenance of an excellent organization spirit within the membership. Twenty-three new members had been admitted, and the number in good standing at the end of the year was 232. The first district branch of the Section—the Ottawa Valley Branch—had been organized, under the chairmanship of G. J. Lane, and it was hoped that other regional groups might be formed, as they would undoubtedly be of benefit to members of the pulp and paper companies in their districts. A Committee on Plant Engineering had been added to the list of such committees covering the wide and diversified field of technical interest with which the activities of the Section was concerned.

The Council and several of the standing committees had maintained close touch with the activities of the Research Institute during the year, and it was satisfactory to note that there had been a substantial increase in the activities of the Institute during the year.

Woodlands Section

W. H. Delahey, chairman of this Section, reported that the Section had made good progress during the year, and that the activities of the Section were expanded in several directions. The membership had increased from 115 to 134. The Technical and Woodlands Sections, as a result of the foundation work of the past few years, had been studying their marginal problems together. The solution

of these problems had been furthered and the mutual understanding between mill men and woodsmen had been increased through this joint effort which should result in great benefit to the industry. The joint summer meeting of the Technical and Woodlands Sections was held in Ottawa last July with decided success. The field meeting of the Woodlands Section in July at the Petawawa Forest Experiment Station, was also a success. It was held jointly with the Canadian Society of Forest Engineers, and was attended by representatives of the Canadian Lumbermen's Association, and proved very instructive.

The Forestry Research Conference, which was called by the National Research Council last November to discuss and to make recommendations regarding research work in forestry, was attended by representatives of practically all concerned organizations and groups in the dominion; and was a decided success. The recommendations which were made at that Conference, if carried out, should help to a large extent to solve some of the major problems in forest management.

Good progress had been made in the preparation of the manual on woods operations and it was expected that this would be published in 1936.

Research Institute

F. L. Mitchell, chairman of the Joint Administrative Committee of the Canadian Pulp and Paper Research Institute, reported that during the year W. Gordon Mitchell had been appointed technical advisor to the Committee, and during the nine months in which he had been functioning the program of work had received his personal attention with the co-operation and advice of the various Technical Section committees. Early in the year the committee approved this program as being most consistent with the funds available, and authorized certain changes of personnel amongst the industry group of investigators to facilitate its undertaking. The committee believed that with the completion of these changes a step had been taken towards placing the Institute organization on a worthwhile and truly effective basis.

Forest Products Laboratories

In the annual report of the Forest Products Laboratories (Pulp and Paper Division), details were given as to organization changes and as to work upon the three-fold duties of the Division, namely, the pursuit of a research program, the calibration of Canadian standard freeness testers and British pulp evaluating apparatus, and the furnishing of information, advice and technical services to makers and users of pulp and paper products.

In the research program considerable progress had been made. One result was that arrangements had been made for the manufacture and distribution of the Johnston pulp and fiber classifier after calibration by the Division, as soon as the formal consent of the Dominion Government had been given to the assignment of the Canadian patent rights to the Canadian Pulp and Paper Research Corporation. The committee is also studying, with a view to commercial application, Dr. Maass' photopacimeter, his fiber area meter, and his new device for electrical determination and control of pulp consistencies.

Among other activities in the field of testing may be mentioned tests made in connection with questionnaires distributed by the Committees on Groundwood and Sulphite Pulps, a trial of the TAPPI method for estimating dirt and shives and the use of the Clark Kollergang for evaluating pulps cooked in small autoclaves. A Thwing Initial Tear Tester, a Thwing Research Tear Tester, an Augmenting Attachment for the Elmendorf Tear Tester and a Suvant Stiffness Tester have been purchased.

Details were given of much work in various investigations, and in this connection it was stated that the work on printability of paper undertaken at the request of the Committee on Fine Papers has yielded some striking results in the influence of atmospheric humidity upon paper, a problem of great importance where register on the printing press is concerned. It has been shown that changes due to very high or very low humidities may be irreversible, and sometimes unexpected in character, thus emphasizing the importance of conditions under which paper is stored prior to use.

New President

R. A. McInnis was elected president of the association for the ensuing year, in succession to Brigadier-General White. Mr. McInnis is general manager and director of the Anglo-Canadian Pulp and Paper Mills, Ltd., Quebec, a position he has held since 1927. Previous to that he was for nine years general manager of the Abitibi Pulp and Paper Company.

At meetings of the Technical and Woodlands Sections officials for the ensuing year were elected, as follows:

Technical Section—Chairman, H. J. Rowley; Councillors; Elliott Little, W. B. Scott, and Douglas Hyndman; representative on joint administrative research committee, W. S. Kidd, the retiring chairman of the section.

Woodlands Section—Chairman, M. R. Kane, of Price Bros. & Co., Chicoutimi; Vice-chairman, H. G. Schanche, of Toronto; councillors: G. E. Boisvert, F. Faure, and V. E. Johnson, of Montreal; J. O. Wilson, of Quebec City; S. L. Decarteret, of East Angus, Que., and R. W. Lyons, of Kapuskasing, Ont.; treasurer, A. E. Cadman; and forester-secretary, A. M. Koroleff, of Montreal.

There were general luncheons in connection with the proceedings on Thursday and Friday. The guest speaker on Thursday was Principal Arthur E. Morgan, of McGill University, and the guest speaker on Friday the Hon. Honore Mercier, Minister of Lands and Forests for the Province of Quebec.

Superintendents Hold Ladies' Night

KALAMAZOO, Mich., February 3, 1936—The Michigan Division of the Superintendents' Association held their Ladies' Night Party at the Park-American Hotel on Saturday night, January 25, 1936.

Inclement weather held the anticipated attendance down somewhat but the occasion was a grand success nevertheless. The meeting started off with a dinner, with music by a local orchestra and entertainment and singing was enjoyed during the meal. Dancing followed until a late hour. National Secretary Robert Eminger arrived too late for the dinner but participated in the later festivities.

Among those present were R. V. Stewart and daughter, Miss Ann; Mr. and Mrs. Harry Pearson; Mr. and Mrs. Harry Bradford; Mr. and Mrs. Leo A. Willoughby; Mr. and Mrs. Norman J. Cowie; Mr. and Mrs. Henry Nendorf; Mr. and Mrs. Arthur Cole; Mr. and Mrs. Harold M. Annis; Mr. and Mrs. Otto F. Fischer; Mr. and Mrs. Frank Wittington; Mr. and Mrs. James Wise; Mike Redmond and Miss Helen Redmond; Mr. and Mrs. L. L. Griffiths; Mr. E. M. Cowling and Miss Carrie Stoerie; Mr. and Mrs. Al Sherwood; Mr. and Mrs. Paul Fortier; Mr. and Mrs. Arthur Woolam; Mr. and Mrs. Larry Lynd; M. and Mrs. O. W. Callighan; Mr. and Mrs. L. M. Mongreig; Mr. and Mrs. Frank Eilers, and Joseph Eilers; Mr. and Mrs. W. S. Taylor; Dr. and Mrs. E. A. Honey Jr.; and Mr. and Mrs. Jacob Boodt.

Boston Paper Business Fairly Good

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., February 3, 1936—Wholesale paper business in the Boston area was fairly good, on the average, during last week, and normal for the season. The majority of dealers in fine papers noted a decline during January. In a few cases, the volume of orders kept up exceptionally well, being better than the previous month and also better than January of last year. According to a dealer, the situation "looks a little more hopeful." In wrapping paper, business proceeded fairly well on regular lines, about normal for the period of the year. Specialties were rather quiet.

The paper stock market sustained strength and activity, with prices tending higher. A dealer states: "The month of January was not so active as November and December. There was no weakness in prices, but the strenuous demand for raw material was not so evident in January as in the previous months. However, we expect a good spring business and more activity is very evident, having in mind the inflationary tendencies of the present period. Everyone seems to think prices will be higher."

Under old papers, old newspapers advanced to .27½@ .30 from .25 @ 27½, overissue news to .40 from .35 and kraft corrugated boxes to .95 @ 1.00 from .90 @ .95. Several grades of bagging appreciated in value, foreign manila rope going up to 2.40 @ 2.50 from 2.25 @ 2.30, domestic manila rope to 2.40 @ 2.50 from 2.25 @ 2.50, transmission rope to 1.15 @ 1.25 from 1.00 @ 1.10, foreign gunny No. 1 to 2.15 @ 2.25 from 2.00 @ 2.25, domestic gunny No. 1 to 1.90 @ 2.00 from 1.80 @ 2.00 and foreign scrap burlap to 2.20 @ 2.35 from 2.00 @ 2.15. New and old domestic rags were unchanged in price. In foreign rags, old fustians rose to a range of 1.90 @ 2.00 from a flat 1.90. New silesias advanced, in some quarters quoted at 4.75 @ 5.00, and in others as high as 5.00 @ 5.25. The former price was 4.50 @ 4.75.

The twine market is disturbed due to the processing tax rebate matters.

TAPPI Notes

Container Testing Laboratories are now located at 45 East 22nd street, New York.

Lewis H. Reed who was formerly technical director of the Escanaba Paper Company is now with the Continental Paper and Bag Corporation at York Haven, Pa.

Lyman Smith, who for the past few years has been at the Richmond, W. Va. plant of the Cherry River Paper Company, has resigned his position and may be reached at Brattleboro, Vt.

Lucien H. Cole, formerly with the Union Bag and Paper Company, Hudson Falls, N. Y., is now at Potsdam, N. Y., and working at the plant of the Racquette River Paper Company.

Warren A. Chilson, formerly engineer at the Forest Products Laboratory, has gone with the Cellufoam Corporation of New Jersey, located in Chicago, Ill.

Uno G. Fryklund is now located with Edward Lloyd Ltd. of Sittingbourne, Kent, England, having left the St. Helens Pulp and Paper Company, at St. Helens, Ore.

W. J. Garding is chemist for the Wausau Paper Mills Company at Brokaw, Wis., having recently left the Watab Paper Company.

T. M. Barry is now located at the Madawaska, Maine, plant of Fraser Companies, after having been for some time in Edmundston, N. B.

Harold S. Morse has gone with the Maine Seaboard Paper Company, Bucksport, Me. from the N. B. International Paper Company.

H. E. Whitaker is back at Chillicothe, Ohio, after having been at the Kingsport, Tenn. and Philadelphia plants of that company during the past few years.

F. C. Stamm, formerly of the Upson Company, Lockport, N. Y., is now with the Armstrong Machine Company, Three Rivers, Mich.

Andrews Celebrates Twentieth Anniversary

The Andrews Paper House of York, Pa., is celebrating its twentieth anniversary. The firm opened for business in York September, 1916, at 27 North Beaver street. It selected York for two reasons, first it was without a paper distributor, and second it was known to be a progressive business city with progressive business men.

Starting with a small organization of three, the business grew and today in addition to the inside organization, the firm has six salesmen who cover territory in Pennsylvania, Maryland and Virginia. The first year in business the firm had opened less than one hundred accounts; today it serves almost two thousand firms with their paper requirements.

Operating both a coarse paper and a fine paper department, places the firm in a position to give complete service on the paper requirements of the community. The firm's trucking service has branched out until today it serves York and the surrounding territory in a most acceptable manner with sidewalk truck delivery over night, as far as one hundred miles from York.

The Andrews Paper House of York is a division of S. Walter, Inc., of Philadelphia, Pa.

New England Paper Council Meets

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., February 4, 1936—The quarterly meeting of the New England Paper Trade Council, an organization of union officials in the paper mills of this territory, was held January 26 at Caledonian hall, John W. Bailey of Eagle Lodge Papermakers presiding. Considerable time was spent in hearing complaints from a number of the 65 delegates present that paper manufacturers were working employees overtime and abolishing overtime pay. Members of the council were requested to follow up such complaints and report to the council more definitely.

The council was addressed by Kenneth Taylor, legislative agent of the Massachusetts Federation of Labor, Urban Fleming, president of the Holyoke Central Labor Union, and Joseph Marion, business agent of the papermakers.

These officers were elected: President, Albert Langton of Northbridge; vice president, Charles Garrow of Manchester, Conn.; secretary-treasurer, Albert Ross of Southbridge. The next session will be held in Leominster.

Samuel L. Foster Goes with Union Bag

HUDSON FALLS, N. Y., February 3, 1936—Announcement is made of the appointment of Samuel L. Foster, of Rumford, Me., as resident manager of the Union Bag and Paper Company, and he has already assumed his new duties. John T. Gamble, who for several years has been general manager of the numerous plants of the company, with headquarters in this village, will retain that capacity with offices at Savannah, Ga. Mr. Gamble and family have already left for the South, where he plans to establish a home.

National Paper Trade Program

The following is the preliminary program for the annual convention of the National Paper Trade Association to be held at the Waldorf-Astoria Hotel, New York, February 17-21, 1936:

SATURDAY, FEBRUARY 15

10:00 AM Executive Committee, Carpenter Suite.

SUNDAY, FEBRUARY 16

3:30 PM Board of Directors, Assembly Room L-M.

MONDAY, FEBRUARY 17

9:30 AM Blotting Committee, Assembly Room P.
9:30 AM Cover and Text Com., Assembly Room R.
10:30 AM Opening Session, Jade Room.
12:30 PM Survey Com. Luncheon, Assembly Room N.
2:00 PM Fine Paper Merchandising Com., Assembly Room R.
2:00 PM Book & Offset Paper Com. Pillement Suite.
2:00 PM Wrapping Paper (Kraft) Com., Jansen Suite.
4:00 PM Groundwood Committee, Assembly Room P.
4:00 PM Wrapping Specialties Com., Assembly Room L-M.

TUESDAY, FEBRUARY 18

9:00 AM Bag Committee, Jade Room.
9:00 AM Writing Paper Com., Assembly Room L-M.
11:00 AM Bristol Board Blanks & Tag, Assembly Room P.
11:00 AM Envelope Committee, Pillement Suite.
11:00 AM Twine Committee, Assembly Room J-K.
11:00 AM Wrapping Paper Merchandising Com. Meeting & Luncheon, Room 4-D.
2:30 PM General Session, Jade Room.
2:30 PM Standing Com. on Simplification & Standardization of Polished Cotton Twine, Assembly Room P.
5:00 PM Newsprint Committee, Assembly Room R.
7:30 PM Fine Paper Governing Com., Pillement Suite.
7:30 PM Wrapping Paper Governing Committee, Assembly Room L-M.
9:00 PM Board of Directors, Assembly Room L-M.

WEDNESDAY, FEBRUARY 19

9:00 AM Tissue & Allied Prod. Com., Assembly Room L-M.
10:00 AM Fine Paper Division Meeting, Jade Room.
11:00 AM Gummed Tape Com., Assembly Room J-K.
2:30 PM Wrapping Paper Div. Meeting, Jade Room.
7:00 PM Round Table Dinner of Presidents, Secretaries & Treasurers of Local Assns., Assembly Room L-M.
8:00 PM Box Paper Committee, Assembly Room R.

THURSDAY, FEBRUARY 20

10:00 AM Annual Meeting National Paper Trade Association, Jade Room.

TAPPI Medal to W. H. Millspaugh

The executive committee to the Technical Association of the Pulp and Paper Industry is pleased to announce that in accordance with the provisions of the Articles of Organization of the Association, it has unanimously voted to award its fifth Gold Medal to William H. Millspaugh, a TAPPI member and President of Centrifugal Steel, Inc., Sandusky, Ohio, and Millspaugh, Ltd., Sheffield, England.

When Mr. Millspaugh applied for membership in the Technical Association in 1916, he indicated his qualifications as a designer, inventor, salesman and manufacturer of hydraulic and paper machinery covering a period of 23 years.

He is probably best known as an inventor of the suction roll and its application to the paper machine. For many years he was President of the Paper and Textile Machinery Company, Sandusky, Ohio, makers of centrifugally cast suction rolls, pumps and shower pipes. A report of the ramifications of Mr. Millspaugh's mechanical interests would fill a good size volume.

Some of his accomplishments will be discussed by W. G. MacNaughton, who will make the official presentation in accordance with the wish of the medallist.

Although Mr. Millspaugh now spends most of his time in England, he has arranged to be present at the TAPPI meeting Luncheon, on Thursday, February 20, in the Grand Ballroom of the Waldorf-Astoria Hotel, New York, to receive the medal in person. Attendance at the luncheon is open to anyone desiring to be present.

Following the medal presentation, those present will hear the Hon. Frank A. Vanderlip, formerly President of the National City Bank of New York, and Assistant Secretary of the Treasury. Mr. Vanderlip will talk on the timely subject of "Tomorrow's Money."

In consideration of the large attendance by TAPPI members and other executives of the pulp, paper and allied industries, reservations should be made immediately with R. G. Macdonald, Secretary of TAPPI, 122 East 42nd street, New York.

TAPPI to Consider Non-Fibrous Raw Materials Specifications

An innovation at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, February 17 to 20, at the Waldorf-Astoria Hotel, New York, will be the consideration that will be given for the first time to the preparation of specifications for non-fibrous raw materials.

At the First General Session, John Traquair, General Chairman of the TAPPI Raw Materials Division will outline the general plan of the Technical Association.

An open meeting will be held during the session of the Alkaline Pulping Committee on Monday afternoon, February 17, at which time the possibilities regarding the development of specifications for lime and saltcake will be discussed.

On Tuesday afternoon during the session of the Coated Paper Committee, an open meeting will be held to discuss possible specification development for casein.

All buyers and sellers of these commodities are urged to be present and to enter into the discussion to guide the committee in their work on specifications. Representatives of the American Society for Testing Materials will be present to show how that organization has accomplished its excellent work along similar lines.

Arthur S. Cosler Goes with Bauer Bros. Co.

The Bauer Brothers Company, Springfield, Ohio, announces to the trade the connection on the first of the year of Arthur S. Cosler as sales manager. Mr. Cosler is well-known to many of the mills in the United States and Canada and his many friends will doubtless be pleased to know of this connection which promises to be a mutually satisfactory one to everyone concerned. It is hoped Mr. Cosler will have a warm reception when the opportunity enables him to call on the various mills.

The Bauer in the few years of its existence has become very well-known to the trade and promises to be of increasing service in additional fields where it has not as yet been introduced. The Bauer Laboratory, which contains full-sized paper machinery, is constantly being used by the clients of the company, and additional service that the Bauer can render is continuously being developed and expanded.

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COMING EVENTS IN THE PAPER INDUSTRY

American Paper and Pulp Association, Fifty-Eighth Annual Convention and Meeting, Waldorf-Astoria Hotel, New York, February 17-21.

Technical Association of the Pulp and Paper Industry, Convention, Waldorf-Astoria Hotel, New York, February 17-20. Annual Luncheon, Waldorf-Astoria Hotel, Thursday, February 20.

Salesmen's Association of the Paper Industry, Annual Meeting and Luncheon, Waldorf-Astoria Hotel, New York, Tuesday, February 18.

New York Association of Dealers in Paper Mill Supplies, Annual Banquet, Hotel Commodore, New York, February 19.

National Paper Trade Association of the United States, Convention, Waldorf-Astoria, New York, February 17-21.

PAPER BOX INDUSTRY SHOWED MARKED IMPROVEMENT LAST HALF OF 1935

In keeping with the increased shipments of merchandise and the expansion in industrial programs involving the use of containers, there was a marked improvement in the paper box industry during the third and fourth quarters of 1935. The first half of the year had been generally unsatisfactory. The rise which started in July in both production and sales, however, was sufficiently persistent to enable manufacturers and distributors to close 1935 with a tonnage approximately 15 to 20 per cent in excess of that recorded for 1934.

Distributors of consumers' goods were largely responsible for the recovery, but fiber and corrugated boxes were adopted by many industries to replace other types of containers. The introduction of cans by breweries opened an entirely virgin field for this division. The many new uses designed for paper boxes, together with the shift of demand to the better and more expensive types, also were factors in the heavier tonnage moved. While moderate mark-ups were made in some lines, the average of prices remained close to the previous year's position.

In fact, competition in the form of the entrance of new manufacturers into the field was instrumental in keeping prices below the level where normal profits could be shown. The price structure has been strengthened, however, by the practical elimination of burdensome inventories, as manufacturers have been aligning production closely to the scope of demand. The current year opened strongly, and with indications of the needs of consumers broadening, according to a survey of the paper box industry, which has just been completed by Dun & Bradstreet, Inc.

Following the poor showing of the first half of 1935, when sales of folding boxes, barely equalled the 1934 comparative total, a sudden reversal of the downtrend occurred in July. The constant broadening of demand in the succeeding months enlarged production for the year by 8 to 10 per cent over 1934, while sales gained 10 to 15 per cent in the same comparison. In the tobacco and cigarette box branch, sales were up nearly 20 per cent.

While the general price level remained low, the increased volume permitted more profitable operations for most of the manufacturers. As a whole, the folding box division was in better shape at the beginning of the current year than it was at the same time in 1934. In addition, the low inventories accompanied by expanding orders indicate a large increase in both production and distribution during 1936, with a general strengthening of prices expected.

With the broadening use of folding boxes for display and advertising work has come a stronger demand for the better qualities. Manufacturers of candy, tobacco products, clothing and millinery specified more merchandise in the upper-price brackets than they did a year ago. To a smaller extent, boxes for raisins and dried fruits, cakes, pies, laundry, and millinery were of a higher grade, with both color and decorative designs stressed.

With the exception of April, when the difference was insignificant, operations of set-up paper box manufacturers for every month of 1935 were at a faster pace than in the comparative 1934 period. Following the usual spring peak in March, operations receded gradually until the year's low was touched in July. For August, however, schedules were restored to the March level, and with the advance in September reached the year's high in October.

This brought operations for the latter month 15.9 per cent above the March rate and 27 per cent higher than that of October, 1934. As a result, 1935 output in unit volume in the set-up division ranged from 15 to 18 per cent larger than in 1934, with some months exceeding the production for any preceding one back to 1930. Prices, however, did not follow the inclining trend of sales, averaging about 5 per cent less than a year earlier.

In addition to the low prices, the highly competitive conditions in this division, which must produce a special article for the customer's individual requirements, resulted in rather slim profits for the year and in some instances did not match those of 1934. At the opening of the current year, orders were on the increase from the shoe, cosmetic, drug and candy trades, and larger specifications were placed by department stores and wholesale grocers.

Production of corrugated and solid fiber shipping containers during 1935 was around 10 per cent larger than for 1934. This enlargement was brought about almost entirely by the increased sales accompanying the greater activity in most branches of business during the second half of the year. Output during January continued to average 10 per cent above that of a year ago, but quotations on some grades were about 5 per cent lower than at that time.

Geographically, the largest volume was recorded for the East, where there was an increase of 15 per cent over the 1934 total, with the South following with a gain of 12 per cent. Helped by the larger packs of fruits, fish and vegetables, the improvement on the Pacific Coast amounted to 10 per cent. While the rise at some centers went as high as 20 per cent, volume for the Middle Western States was ahead of 1934 by only 8 per cent. The poorest showing was made by the Central States with a gain of 5 per cent.

The wide variations shown in the amount of the increased business from section to section was due primarily to local economic conditions and the movement of consumers' goods, upon which the volume of containers largely is dependent. These variations are not uncommon conditions within this division, because of the relative sensitivity to the trends in the different types of industry which manufacturers serve. The price level was about the same as a year ago.

For each year since 1932, the number of paper box manufacturers that went into bankruptcy has been smaller than that recorded for the one immediately preceding. From the peak established at 35 in 1932, failures dropped to 20, in 1933, a reduction of 42.8 per cent, and in 1934 were lowered by 40 per cent, which brought the total down to 12. For 1935 only 11 failures were recorded.

While the latter represented the fewest failures for any year since 1931, when 6 were set down, the all-time low was touched at 3 in 1930. It also was in 1930 that the defaulted indebtedness of bankrupt manufacturers reached its nadir at $66,600. For 1931 it rose 615.3 per cent to stand at $476,401. The latter figure nearly was doubled in 1932, when the involved liabilities increased to $916,444.

A reduction of 44.5 per cent brought this total down to $508,429 in 1933, which was followed by a rise of 325.9 per cent in 1934, which carried the liabilities of the 12 defaulting concerns to $2,165,618, the largest in the industry history. For the 11 failures in 1935 the liabilities dropped to $383,734, the smallest since 1930, and less than the 1934 peak by 82.1 per cent.

N.A.W.M.D. Banquet To Be Held March 18

Announcement is made by E. J. Keller, chairman of the banquet committee for the Twenty-third Annual Banquet of the National Association of Waste Material Dealers, Inc., that even at the present early date indications are that the Association's banquet this year, which is to be held on the evening of March 18, will be the largest affair of its kind ever held by the association.

Individual applications for tickets covering groups as large as thirty guests for a single concern are already in the hands of the committee. Special features connected with the convention program will bring to New York for the convention and banquet an exceptionally large number of consumers of waste materials and the attendance of dealers will undoubtedly be larger than at any previous convention.

The Twenty-third Annual Banquet will be held in the Grand Ballroom of the Hotel Astor and the committee in charge is making preparations which will make the banquet this year rank second.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES

1935	Total Production Ratio	1934	Total Production Ratio
January	65.8%	January	.....
February	70.0%	February	.....
March	70.5%	March	.....
April	70.0%	April	.....
May	69.4%	May	.....
June	72.3%	June	.....
July (b)	67.8%	July	.....
August	70.9%	August	.....
September (c)	75.0%	September (c)	59.4%
October	75.6%	October	64.2%
November	75.3%	November	61.7%
December (a)	74.3%	December (a)	62.1%
YEAR, 1935	71.2%		

COMPARATIVE WEEKLY SUMMARIES

CURRENT WEEKS, 1936		CORRESPONDING WEEKS, 1935	
*January 4	72.6%	January 5	60.2%
*January 11	76.0%	January 12	65.1%
*January 18	76.8%	January 19	67.0%
*January 25	74.6%	January 26	68.6%

The following statistics show the number of mills reporting by ratio groups:

	Number of Mills Reporting, Current Weeks			
Ratio Limits	Jan. 4, 1936	Jan. 11, 1936	Jan. 18, 1936	Jan. 25, 1936
0% to 50%	142	86	83	75
51% to 100%	198	250	247	181
Total Mills Reporting	340	336	330	256

* Subject to revision until all reports are received. These data exclude (a)—Christmas Day, (b)—Fourth of July, (c)—Labor Day.

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours" were as follows:

PAPERBOARD OPERATING RATIOS

1934		1935		1935		1935	
September	62%	January	61%	May	61%	September	69%
October	63%	February	67%	June	65%	October	76%
November	56%	March	67%	July	59%	November	70%
Dec. (a)	53%	April	61%	August	65%		

Week ending Dec. 7, 1935	67%	Week ending Jan. 4, 1936	51%
Week ending Dec. 14, 1935	66%	Week ending Jan. 11, 1936	65%
Week ending Dec. 21, 1935	70%	Week ending Jan. 18, 1936	61%
Week ending Dec. 28, 1935	37%	Week ending Jan. 25, 1936	64%

Northern New York Paper Men Optimistic

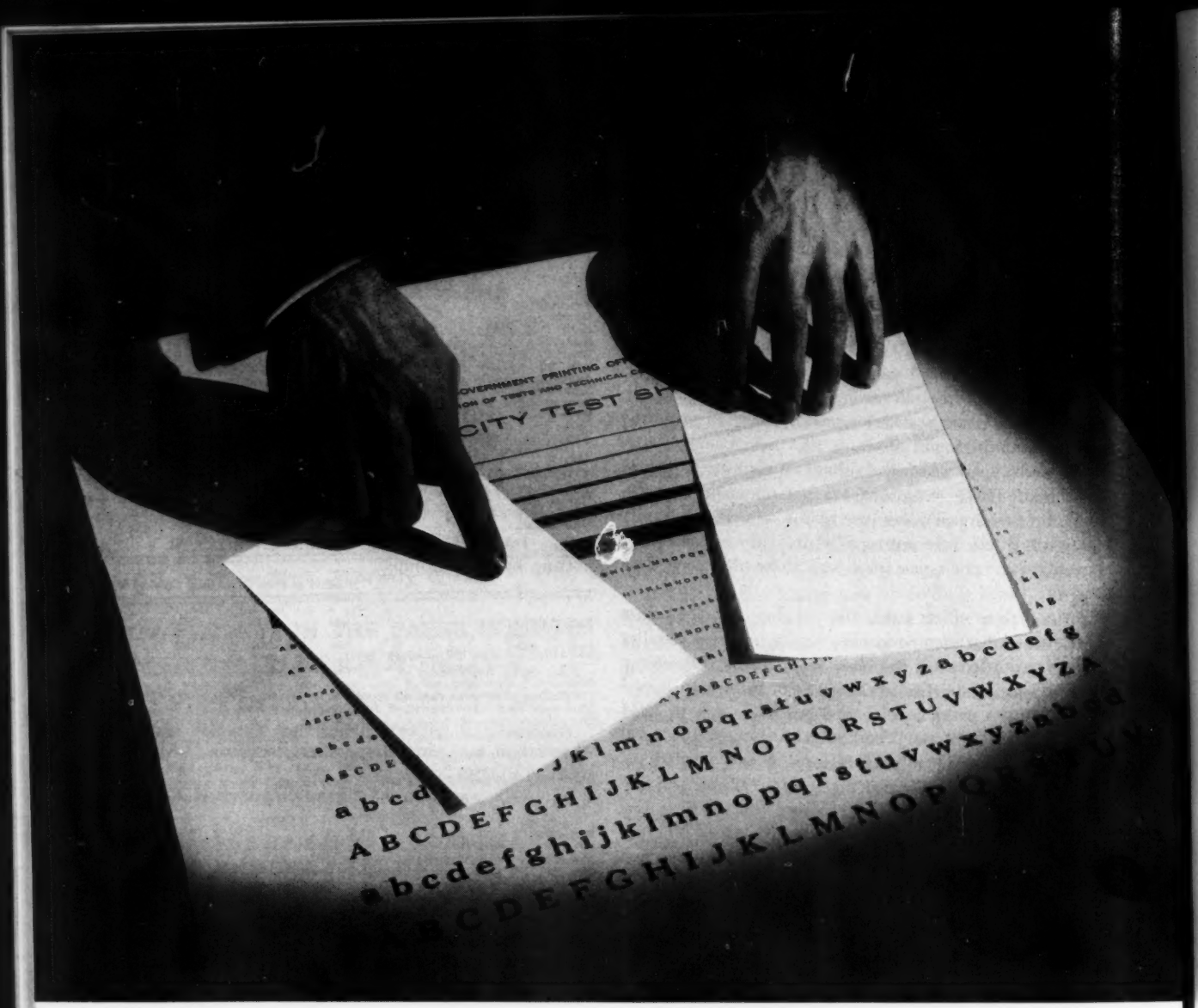
[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., February 3, 1936—Paper manufacturers of this district are optimistic over the outlook for the coming year and expressed confidence on the basis of prospective business ahead. It was also pointed out that much improvement had been shown in business during 1935 over the preceding year.

An official of Knowlton Brothers, Inc., said that his company hoped to handle at least 10 per cent more business this year than in 1935. He pointed out that business was good during the past year, and that a number of good orders are in prospect. "Our 1935 business was 10 per cent better than in 1934," he said, and "we hope to do as much more in 1936."

Good orders are in prospect at the Bagley & Sewall Company, where the record for the last half of 1935 was much better than in the preceding half. Officials of the company look with optimism at the future and feel that business is going to improve this year. The company has not yet booked any large orders, but a number of inquiries have been made and prospective orders are now being considered.

A 2 per cent gain in business during 1935 was shown by the Black River Paper Company, and the outlook for this year is regarded as fairly good. The company contends that there will not be much change during the year inasmuch as there has been no sound recovery as yet.



"Now there's an OPAQUE sheet"

Salesmen are encountering many comments such as this when offering the new improved lines—more opaque, whiter and brighter papers that arouse enthusiasm among paper dealers, printers and consumers.

Because the desired degree of these qualities can be obtained by CRYPTONE and ALBALITH Zinc Sulphide Pigments, which are available in a range of strengths to meet a variety of requirements, the use of these pigments is increasing.

The trade is looking for these qualities. . . . Our Technical Service Department is ready to cooperate with you on any phase of this development.

New Jersey Zinc

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ZINC SULPHIDE PIGMENTS IN PAPER

Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

TAPPI Tentative Annual Meeting Program

Waldorf-Astoria Hotel, New York, February 17-20, 1936

Monday, February 17, 1936

10:00 A.M. GENERAL SESSION. (Astor Gallery)
C. C. Heritage, presiding.
President's Address.
Secretary's Report.
Remarks by C. W. Boyce, Executive Secretary, A. P. P. A.
Report of Joint Textbook Committee.
Raw Materials Developments, by John Traquair. (Including comments on preparation of specifications).
Comparative Pulpwood Growing Capacities of Southwest Georgia and the Fog Belt of the North Pacific Coast, by D. E. Hervey.
Preliminary Report on the Study of Existence and Nature of Pulp Membranes, by H. F. Lewis.
A Contribution to the Mechanism of Bleaching, by F. E. Brauns.
The Effect of pH on the Rate of Chlorine Consumption in Bleaching, by W. O. Hisey and C. M. Koon.

2:00 P.M. MATERIALS OF CONSTRUCTION. (East Foyer).
J. D. Miller, presiding
Materials of Construction Developments, by J. D. Miller.
Cast Ferrous Alloys in the Paper Industry, by F. L. La Que.
Copper and Copper Alloy Metals, by J. T. Kemp.
Insulation Specifications for the Paper Industry, by J. W. Hemphill.

2:00 P.M. ALKALINE PULPING. (Astor Gallery).
H. R. Murdock, presiding.
Alkaline Pulping Developments; by H. R. Murdock.
The Chemical Nature of Dyestuffs in Pine Woodpulp, by G. M. Kuettet, M. W. Bray and C. E. Curran.
Alkali Recovery by Electrical Precipitation, by N. W. Sultzer and C. E. Beaver.
Rate of Digestion of Wood in Sodium Hydroxide Solutions, by W. J. Nolan and D. W. McCready.
Distribution of Digester Heat Following the Blow, by G. H. Tomlinson.
Consideration of Raw Materials Specifications for Lime and Salt Cake.

Tuesday, February 18, 1936

9:30 A.M. STUFF PREPARATION. (Astor Gallery).
G. Lamont Bidwell, Jr., presiding.
The Thorsen-Hery Beater, by G. W. Dodge.
The Cowles System of Detrashing and Defibering Waste Paper Stock, by Edwin Cowles.
Production of Mechanically Defibered Pulps, by A. S. Cosler.
The Refining Action of Discs, by D. Manson Sutherland, Jr.

9:30 A.M. COATED PAPER. (East Foyer).
J. J. O'Connor, presiding.
Coating Equipment Developments, by F. W. Egan.
Raw Materials Developments, by O. W. Calligan.
Finished Products Developments, by H. M Annis.
Offset Lithography on Coated Papers, by R. F. Reed.
Using a Pebble Mill, by S. J. Dickhaut.

2:00 P.M. STUFF PREPARATION AND MECHANICAL PULPING. (Astor Gallery).
F. C. Clark, and M. P. Chaplin, presiding.
Proposed Method of Computing Impact and Contact Inches in Beaters and Refiners, by G. Lamont Bidwell, Jr. and D. Manson Sutherland, Jr.
Report on Stuff Preparation Committee and Mechanical Pulping Committee Study of Refiners, by M. P. Chaplin.
Grinding Pulp with Great Northern Grinders, by G. K. Walker.
Occurrence of Compression Wood in Black Spruce and Its Effect on the Properties of Groundwood Pulp, by M. Y. Pillow, E. R. Schafer and J. C. Pew.
Effect of High Pit Temperature and Preheating the Wood on the Grinding of Loblolly Pine, by E. R. Schafer, J. C. Pew and R. G. Knechtzes. (by title)

2:00 P.M. COATED PAPER. (East Foyer).
J. J. O'Connor, presiding.
Consideration of Problems and Questions Pertaining to the Manufacture of Coated Paper (1) Equipment, (2) Raw Materials, (3) Processing, (4) Finished Product.
Consideration of Raw Materials Specifications for Casein.
Surface Application of Pigments on Paper Machines, by A. E. H. Fair.
Surface Treatment of Paper on the Fourdrinier Machine, by Elizabeth Hunter. (by title).
The Retention of Pigments in Paper, by J. H. Haslam and F. A. Steele.
Effect of Beating and Pigmentation on Sheet Properties, by W. R. Willets.

Wednesday, February 19, 1936

9:30 A.M. HEAT AND POWER. (Astor Gallery).
A. G. Darling, presiding.
The Rate of Drying Writing Paper, by F. W. Adams.
The Rate of Drying Glassine and Greaseproof Paper, by V. F. Waters.
Drying Rates for Tissue and Absorbent Papers, by A. E. Montgomery.
Control of Moisture Content in Paper Undergoing the Process of Progressive Drying, by J. A. Sheehan.
Comparative Head Losses in Various Kinds of Pipe When Stock of Certain Kinds and Consistencies Are Being Pumped, by S. B. Jones.

9:30 A.M. PAPER TESTING. (East Foyer).
B. W. Scribner, presiding
Report of Subcommittees and Developments in Paper Testing, by B. W. Scribner.
Some Observations on Burst, Tensile and Stretch Tests, by J. d'A. Clark.
Studies of Tensile and Bursting Strength, by R. C. Griffin and R. W. McKinley.
Some Notes on the Revision of Methods for Measuring the Strength of Paper, by F. T. Carson.
Qualifications and Training for Microscopy in the Paper Industry, by John Graff (by title).
The Nature and Measurement of Paper Acidity, by B. L. Browning and R. W. Ulm.

2:00 P.M. COLOR, CONTAINERS AND GRAPHIC ARTS. (Astor Gallery).
A. W. Nickerson, J. L. Parsons and W. M. Shoemaker, presiding.
The Paper Industry and the Business Cycle, by L. T. Stevenson.
A Method for Determining the Whiteness of Paper II, by D. B. Judd.
The Application of Color in Printing, by John F. Vance.
Packages and Merchandising, by C. B. Larrabee.
Combining Problems, by W. T. Marble.
Plans for TAPPI Work on Containers and Paper Bags, by A. W. Nickerson, R. M. Bates and Pierre Drewsen.
The American Management Association Packaging Show, by J. D. Malcolmson.

2:00 P.M. PAPER AND PULP TESTING. (East Foyer).
R. G. Griffin and H. W. Morgan, presiding.
Factors Affecting the Determination of Water Vapor Permeability, by Allen Abrams and G. J. Brabender.
Water Resistance of Paper, by P. W. Codwise.
A. Universal Hydrogen Ion Indicator, by D. T. Jackson and J. L. Parsons (by title).
Further Notes on the Kollergang Beating Methods for Pulp Evaluation, by J. d'A. Clark and R. S. Von Hazmburg.
Testing Wood Pulp for Moisture, by F. W. Brainerd.
Pulp Testing by a Rapid Sheet Making Process, by James Coghill.
A Study of Some Variables in the Sheet Making Operation, by F. C. Peterson and F. G. Barber.

Thursday, February 20, 1936

9:15 A.M. GRAND SESSION. (Astor Gallery).
Election of Officers.

9:30 A.M. FUNDAMENTAL RESEARCH. (Astor Gallery).
H. F. Lewis and C. E. Curran, presiding.
Invert Sugar as a Plastizer in Paper, by N. R. Pike.
A Survey of Pitch Troubles in the Manufacture of Sulphite Pulp, by Otto Kress and L. A. Moss.
The Chemistry of Lignin, by Walter M. Fuchs.
The Origin and Development of Cultivated Plants, by A. B. Stout.

9:30 A.M. HEAT AND POWER. (East Foyer).
M. H. Teaze, presiding.
Application of Diesel Engines to the Paper Industry, by T. A. Burdick.
Proper Feed-Water and Boiler-Water Conditioning for High Pressure Boilers, by E. W. Butzler.
Mechanical Design of Electrical Machinery, by C. H. Koch.
The Characteristics of Power Requirements for Paper Machines, by H. W. Rogers.

1:30 P.M. ANNUAL LUNCHEON. (Grand Ball Room).
C. C. Heritage, presiding.
Greetings from F. J. Sensenbrenner, President of A. P. P. A.
Presentation of TAPPI Gold Medal to William H. Millspaugh, Inventor and Manufacturer, by W. G. MacNaughton.
Guest Speaker: Frank A. Vanderlip, Banker and Economist, Formerly president of the National City Bank and Assistant Secretary of the United States Treasury.

8:00 P.M. COLOR LECTURES. (Astor Gallery).
Three lectures on color, somewhat similar to those given at the Annual Meeting of TAPPI in 1935 will be given at the meeting of the Inter-Society Color Council (of which TAPPI is a member). These lectures are open to TAPPI members and friends. Admission will be by ticket only. Tickets may be obtained at the registration table. The lectures are as follows:
Chemistry of Color, by A. C. Gessler.
Color as Light, by A. F. Hardy.
Color in Use, by George Welp.

Copper and the Copper Alloy Metals*

By James T. Kemp[1]

Abstract

Copper and its commercial alloys are described. The physical properties of copper can be varied at will within the limits of severe cold working on the one hand and soft annealing on the other. Other metals are added to copper to make a series of ductile alloys, within definite limits of composition, all stronger than copper itself, with valuable properties and, like copper, capable of being hardened by cold work or softened by annealing.

The brasses are alloys of copper with zinc and in wrought forms cover a range of compositions down to about 58 per cent copper. The 50 per cent alloy is hard and friable and after being ground to powder is used for a brazing solder. The physical properties of the brasses vary with composition.

Other commercial alloys of copper produced in sheet, rod, wire and other wrought forms embrace the true bronzes, with tin, the aluminum bronzes, the cupro-nickels and "nickel silvers," the copper silicon type, or Everdur, and several others of less importance. Beryllium copper is a recent development which with appropriate heat treatment attains physical properties equal to those of heat-treated steels. Tables of tensile properties of each group of alloys are given.

All the copper metals are valuable for their resistance to chemical attack. Significant data are presented on rates of corrosion by SO_2, dilute sulphuric acid, salt spray, and actual sulphite mill exposure.

The exacting demands of modern paper-making have drawn attention to materials of construction to a degree not before equalled in the industry. Long service, cleanliness, resistance to corrosion and low cost in terms of tonnage output are often considered more important than first cost today. Metals among all the materials used in paper mills offer the greatest variety of properties, of adaptability and cost. Many new metals and alloys have appeared, some with distinct merit. Some of the older metals are now made in new forms and with hitherto unsuspected properties. This paper reviews the copper group and briefly brings the metallurgy of copper and of its principal alloys, their qualities and usage, up-to-date; it is hoped, in such a manner as to be valuable as a reference.

Copper Metal

Copper is the most ancient of the metals known to and used by man. It was the first to be improved or "hardened" by alloying with other metals. It is second only to iron at the present time in importance, value, forms and variety of uses.

Copper combines with many other metals to make alloys. Some alloys are extremely useful—some valueless. In some commercial alloys it is the dominating element, in others, such as "copper-steel" and some of the strong aluminums, it is present as a fraction of a per cent only.

Pure or *Refined Copper* is a reddish, relatively soft, very ductile durable metal with high electrical and thermal conductivity. It is hardened by cold working, softened by heating. Reduced to specific values the properties of commercial electrolytically refined copper are:

Composition	Copper plus silver at least	99.900 per cent
Tensile strength	Annealed	33,000 pounds per sq. in.
	Cold rolled, sheets, thin gauges	51,000 pounds per sq. in.
	Hard drawn, wire .102 inch diam.	64,900 pounds per sq. in.
Elongation	Annealed	37 per cent in 2 in. min.
	Cold rolled, sheets	4 per cent in 2 in. min.
	Hard drawn, wire .102 inch diam.	1 per cent in 60 in. min.
Brinell hardness	Annealed, 100 Kg., 10 mm. ball	42
	Cold rolled sheets	100
Electrical conductivity	Annealed	100 per cent +, International annealed copper standard
	Spring temper wire	98 per cent +, International annealed copper standard
	Specific resistivity annealed	1.7241 microhms per cm. per cm.[2]
Thermal conductivity at 64 deg. F., B.t.u. per sq. ft. per inch per hour per degree F. difference		2903
Melting point		1981 deg. F.
Color		Reddish

There are three commercial varieties of copper in common use—Electrolytic, lake, and deoxidized. Electrolytic copper is by far the commonest. It has a high degree of purity and derives its name from the refining process used to rid it of contaminating elements. The name lake copper is descriptive of fire refined copper from the mining district in upper Michigan. It too is a high purity metal but normally carries small amounts of arsenic and silver, enough to depress conductivity and to affect its other properties. Both electrolytic and lake copper carry oxygen in the form of cuprous oxide, usually this amounts to 0.04 per cent oxygen. Deoxidized copper is oxygen free. Copper can be deoxidized in several ways, the most common commercial practice being the addition of a small percentage of phosphorus to the molten metal before casting.

Copper hardens when cold worked by rolling or drawing. The degree of hardening varies with the work done upon it. Sheet metal approaches 55,000 pounds per square inch tensile strength as a practical maximum at about 60 per cent reduction in cross-sectional area, after which further hardening is imperceptible. Wire behaves similarly, the maximum tensile strength for all practical purposes being about 66,000 pounds per square inch at 10 numbers B and S, or 90 per cent reduction in cross-sectional area.

Ductility naturally drops off as the metal becomes hardened, but copper never becomes truly brittle by reason of cold working. A few years ago one of my associates took a 1 inch hot rolled annealed rod down to .002 inch wire without intermediate anneal. This involved about 50 passes through drawing dies.

Copper has the highest electrical conductivity of all the metals of commerce. This property is but slightly affected by hardening from cold work. The excellent balance of conductivity, strength when cold drawn and high ductility are invaluable to the electrical engineer, who quite willingly designs coils to be wound edgewise from bars as much as 6 inches wide x ¾ inches thick. Coppersmiths also take advantage of the ductility of the metal when they dish and flange tank heads or hammer intricate shapes from flat sheets.

Fig. 1 illustrates graphically the effect of cold work measured by the reduction of cross sectional area on the physical properties. Ductility, measured by elongation is.

* To be presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, Waldorf-Astoria Hotel, New York, N. Y., Feb. 17 to 20, 1936.

[1] American Brass Company, Waterbury, Conn.

of course, reduced as the tensile strength builds up. The "hardening" effect of cold work is very useful and taken full advantage of in making rod, strip and, above all, wire for electrical transmission.

Copper anneals when heated to temperatures above 425 deg. F, that is, the effects of cold work are erased, the metal becomes soft once more. This behavior prevents the use of cold rolled or drawn copper in many places where it would or might be heated above 350 deg. F. The extent of the softening of copper by heat can be controlled by the temperature to some degree. Fig. 2 illustrates the relation of tensile strength and elongation in 2 inch test specimens to temperature attained. This curve also shows clearly the delaying influence of silver, arsenic and antimony in annealing. (Electrolytic, copper 99.9565 per cent; Lake, copper 99.8762, silver 0.0868, arsenic 0.0020, antimony 0.0026 per cent.)

All forms of copper, with the exception of that which is electro-deposited, start as castings. They have the characteristic treelike crystalline structure of cast metals. The size of the crystals or grain depending upon the mass of metal and the mold, i.e., the rapidity of solidification. Cuprous oxide droplets are found all through the metal but most abundantly near the top and between the crystals themselves.

Hot working or cold working followed by annealing completely changes the structure of castings to "polygonal equiaxed crystals." The parallel banding seen crossing the single grains in micrographs is designated "twinning" and is precisely like twinning in brass seen in Fig. 5. The crystals of cold worked copper deform proportionally to the deformation of the piece. This action involves plastic flow within the grains that is revealed on a polished etched section by the gray more or less parallel lines traversing the grains as well as elongation of all grains in the direction of working.

Sheet copper is widely used for tanks, evaporators, launders, trays, parts of mechanical equipment, in chemical plants, breweries and other beverage and food product plants, sugar refineries, for ventilating ducts, especially around storage batteries, for roofing and many other building purposes such as air conditioning apparatus.

Copper pipe and tube are used for conveying water, foodstuffs, beverages, pulp and paper mill stocks, chemi-

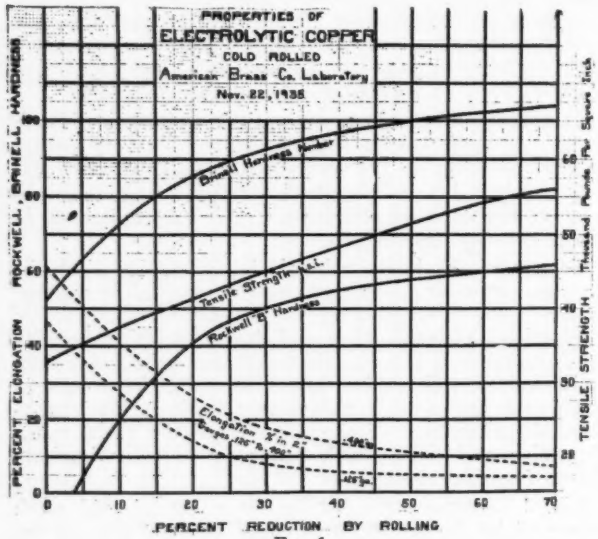

FIG. 1
Properties of copper resulting from cold rolling.

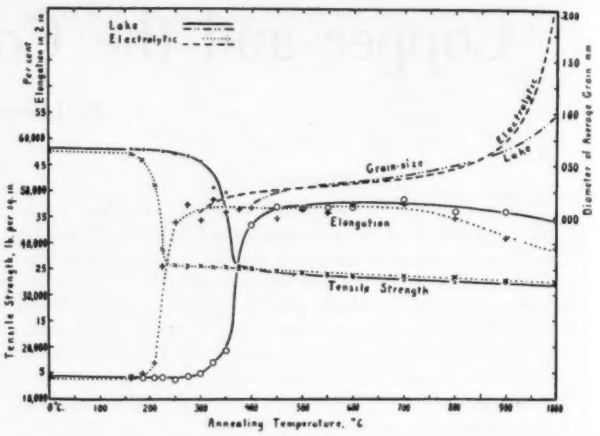

FIG. 2
Properties of cold rolled electrolytic and lake coppers resulting from annealing at several temperatures.

cals, gas, and oil. Rods, bars, and castings find their greatest usefulness in electrical machinery for bus bars, windings, commutator bars, switch parts and terminals of innumerable variety. Copper is a familiar material to pulp and paper men who have used it around digesters for blow lines and piping, for pulp lines, tanks, machine bodies, etc., etc., for many years. A popular recent development is light wall seamless copper tube in sizes ⅛ to 4 inches and a complete series of fittings for assembling with solder or with compression fittings. This tube is strong and yet flexible enough to take field bends and be laid in crooked lines often without other fittings than couplings and tees.

By far the greater part of the copper absorbed by commerce is electrolytically refined. Lake copper is declining in quantity partly because of the declining resources of the Lake Superior mines, partly because of the uniformity and excellence of and great output of electrolytic copper. Lake is still preferred for some purposes. Practically all pipe and tube are made of deoxidized copper. Deoxidized copper has certain advantages in corrosion resistance, ductility and welding. Specially deoxidized copper with little or no residual deoxidizer remaining has attracted attention for particular purposes.

The lists of uses just given suggest the qualities in copper that make the pure metal so important. Briefly, copper is resistant to atmospheric oxidation, to attack by water, by foodstuffs, many chemical and organic products. It is malleable, tough, readily worked. It has high heat and electrical conductivities and a pleasing appearance.

Copper Alloys

The wrought alloys of copper are numerous and very important. The most used are those made with:

Zinc	— the brasses, ductile up to about 44 per cent zinc.
Tin	— the true bronzes, ductile up to 10 per cent tin.
Nickel	— the cupro-nickels, ductile through the whole range from copper to nickel.
Silicon	— Everdur, ductile up to 4 per cent silicon, other elements present.
Aluminum	— the aluminum bronzes, ductile up to 10 per cent aluminum.
Cadmium	— high strength electrical alloys, relatively high conductivities, ductile to 4 per cent cadmium.

One or more alloying elements may be used. Lead is often a third addition and imparts free cutting qualities or assists the lubrication of friction bearing surfaces. Of less importance, yet strictly alloying elements, are silver, arsenic, and phosphorus. Each of these three elements is used in small amounts to accomplish some definite purpose, as enhanced strength with minimum reduction of conductivity, delayed annealing, or removal of oxygen

Beryllium and combinations of nickel and silicon, or nickel, aluminum and silicon, in copper make alloys hardenable by low temperature heat treatment.

Foundry castings are made of copper alloyed with each of the metals mentioned in the foregoing list. Foundry alloys are usually more complex than those that are rolled and very often carry more lead or iron or tin than is permissible in wrought metal. Often castings must be stiff and rigid, capable of supporting heavy compressive loads without deforming. Bearing bronzes are an example. Campbell lists bearing bronzes with as much as 20 per cent tin.

Limits of Alloy Compositions

Each of the six groups first named above, the brasses, bronzes, etc., have certain properties in common. Five of them are reddish to yellow or bronzy in color, are ductile, malleable and tenacious within the limits stated. When more than the amount of alloying metal indicated is added the alloys change in color, become intensely hard, stony, friable, of very little use. The copper-nickel alloys by contrast are ductile and therefor useful over the whole range of compositions from pure copper to pure nickel. Nickel exerts a powerful influence on color. Less than 10 per cent of nickel added to copper will change the metal from red to the familiar silvery color.

The 50 per cent copper-zinc alloy, brazing solder, is a sort of commercial curiosity. It is brittle—so much so that it is ground to powder in mills like coffee grinders, graded by screening and sold in the pulverized form. But its usefulness as a solder is derived from two things, first, low melting point, 1600 deg. F, and, second, rapid boiling off of zinc from the molten solder. A finished braze has much less zinc than the original solder, and for this reason is no longer brittle.

Effect of Alloy Additions—Zinc, the Brasses

Adding an alloying metal to copper, any of those named above "hardens" the copper, makes it stronger, affects all properties. The extent of the effect or the final net result of the addition depends on the element or elements added and their amounts. Tensile strengths of the brasses are seen by reference to Fig. 3, to vary directly with the amount of zinc added up to 35 per cent regardless of annealing temperature or degree of cold work. Mill men often measure "cold work" by counting the Brown & Sharpe Gauge numbers the thickness of a sheet of metal is reduced by rolling between annealings.

At about 38 per cent zinc, (62 per cent copper) there is a sharp break in the curves corresponding to a change in metallurgical structure. Fig. 4 presents the variation

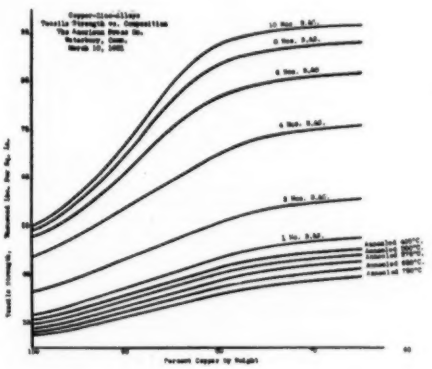

FIG. 3
Variation of tensile strength of brass with composition, several tempers.

FIG. 5
Microstructure common brass, annealed, 75×.

of thermal and electrical conductivities with zinc additions up to 50 per cent.

All the properties of an alloy are not affected equally by the additions. Compare, for example, the slight influence of 10 per cent of zinc on tensiles with the depression on conductivities corresponding. It will be seen, however, that the changes are definite and continuous within the range mentioned from pure copper down to about 62 per cent. All these series are, in metallurgical terms, single phase solid solutions. This means that the microstructural character of wrought metal is essentially unaltered by the zinc present. In this range the alloys are called the alpha brasses. Fig. 5. At 38 per cent zinc, copper has reached a saturation point. Put more zinc in and the excess forms a new material of different crystalline behavior, color and hardness. At 50 per cent of zinc the entire mass of metal is uniformly this second constituent. It is bright yellow,

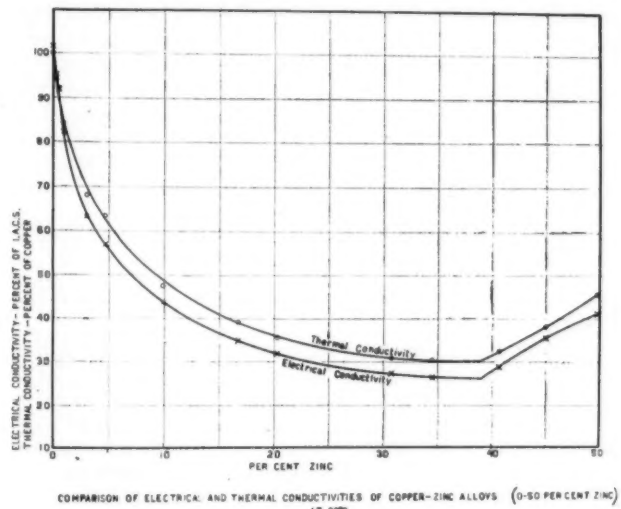

FIG. 4
Variation of thermal and electrical conductivity with composition of brass.

brittle, easily corroded. Between these two percentages the metal is a mixture of the two constituents. The two constituents can be seen in Fig. 10, in which the beta or zinc rich phase appears clear, sharply outlined, irregular in shape. The alpha has etched gray and shows faintly the characteristic twin bands. It is the appearance of the second constituent that accounts for the sharp upturn of the conductivity curves of Fig. 4. The second constituent, or beta, has several valuable properties. A little scattered through the mass improves the machinability of brass. It also improves hot working behavior. Brasses with 58 to 60 per cent copper hot roll, forge and extrude with ease.

Chemical behavior of the brasses does not parallel their physical behavior. Generally speaking, resistance of the red brasses, 15 to 20 per cent zinc, to solution attack by corroding agents is equal to or greater than copper and is distinctly better than the yellow brasses 33 to 37 per cent zinc. The resistance of low copper brasses, Muntz metals, etc., in which the copper is less than 62 per cent is poorer, as will be discussed later on.

TABLE I

REPRESENTATIVE PHYSICAL PROPERTIES OF COMMERCIAL ANNEALED BRASSES

Name	Composition: Copper	Zinc	Lead	Tensile strength, Pounds per sq. in.	Elongation in 2 inches, Per cent	Rockwell[1] hardness, "B" scale	Electrical conductivity, Per cent I.A.C.S.
Copper	99.9	....	...	33,000	37	Too soft	100 +
Commercial bronze.	90	10	...	37,000	40	1	40.9
Red brass pipe....	85	15	...	42,000	42	..	37
Red brass, 80 per cent	80	20	...	43,000	50	11	32.5
Spring brass.....	72	28	...	47,000	55	20	28.6
Eyelet brass.....	68	32	...	46,000	58	22	27.3
Yellow brass.....	63	37	...	48,000	50	..	25.9[2]
Muntz metal.....	60	40	...	57,000	48	42	28.6
Clock brass.....	61.5	37	1.5	45,000	40	13	....
Free cutting yellow Brass rod.....	62	35	3.0	47,000	60	16	25
			Tin				
Fourdrinier wire...	81.0	18.75	0.25	49,000	43[3]	..	32.2
Admiralty tube....	70	29	1.0	55,000	60	..	24.65
Tobin bronze rod..	60	39.25	.75	54,000	50	..	24.93
Naval brass rod...	60	39.25	.75	54,000	40	..	....

[1] 1/16 inch ball penetrator, 100 Kg. load. [2] Per cent in 10 inches.

True Bronzes: Copper and Tin

The bronzes are metallurgically very much the same as brasses though there are fewer of them. The limit of rolling mill ductility is reached at about 10½ per cent tin, corresponding to the limit of simple solubility. Beyond 13 per cent tin the bronzes become hard and of restricted practical use. Tin has a more pronounced influence on copper than zinc. The tensile strength of 10½ per cent tin commercially annealed bronze sheet is about 25 per cent higher than yellow brass, 37% zinc.

	Bronze	Yellow brass
Tensile strength, pounds per square inch.....	60,000	48,000
Elongation in 2 inches, per cent.....	65	50

Cold rolled or drawn bronzes are correspondingly "harder" than brass.

Wrought bronzes have not had as wide industrial use as they deserve, probably because of their higher cost. They are used in hard temper for springs, both strip and wire. The low tin types, 1 to 2 per cent, make excellent high strength wire for transmission line, guy and messenger strand and trolley wire. Corrosion resistance on the whole is better than the brasses. Commonly a little phosphorus is added as a deoxidizer when casting tin bronzes, hence the name "phosphor bronze."

TABLE II

REPRESENTATIVE PHYSICAL PROPERTIES OF COMMERCIAL ANNEALED BRONZES

Name	Composition: Copper	Tin	Lead	Tensile strength, Pounds per sq. in.	Elongation in 2 inches, Per cent	Rockwell[1] hardness, "B" scale	Electrical conductivity, Per cent I.A.C.S.
Copper	99.9	..	...	33,000	37	Too soft	100 +
Special bronze.....	98.75	1.25	...	40,000	48	..	43
Signal bronze wire	98.25	1.75	...	50,000	33[2]	..	....
Phosphor bronze...	96.0[3]	3.75	...	45,000	50	30	12.62
Phosphor bronze...	95.0	5.0	...	50,000	55	30	18.37
Leaded phosphor bronze rod.....	94.0	5.0	1	50,000	40	..	18.37
Phosphor bronze...	92.0	8	...	55,000	70	38	13
Phosphor bronze...	89.5	10.5	...	60,000	65	52	10.6

[1] 1/16 inch ball penetrator, 100 Kg. load. [2] Per cent in 10 inches. [3] Phosphorus present.

Copper-Nickel

Nickel and copper form a series of ductile alloys in all proportions. Small additions of nickel change the color of copper much more than any other element. A 10 per cent nickel alloy is silvery but tarnishes brassy. Larger amounts are used where permanence and brilliance of color are wanted. Straight cupro nickels, in the low nickel ranges, were formerly much used for electrical resistance wire but they have been superseded by the crome-nickel alloys. 20 and 30 per cent cupro, especially the latter, resist corrosion very well. Condenser and heat exchanger tubes of these alloys are the best for salt waters, alkalis, high temperatures and many severe duties. This group has very good tensile properties for non-ferrous metals.

Copper-Nickel-Zinc

Perhaps the largest poundage of copper-nickel alloys made are those containing zinc also. They are popularly known as the "nickel silvers." In composition they range from 20 per cent nickel with 5 per cent zinc to 10 per cent nickel, 40 per cent zinc. Only the low zinc, high nickel alloys are engineering materials and are used for heat exchanger tubes, head plates, valve trim, chemical and cooking apparatus, turbine blading, resistance wire, etc. The higher zinc alloys are used by the silverware, jewelry and plumbing trades and for architectural effect.

TABLE III

REPRESENTATIVE PHYSICAL PROPERTIES OF ANNEALED COPPER-NICKEL AND COPPER-NICKEL-ZINC ALLOYS

Name	Composition: Copper	Nickel	Zinc	Tensile strength, Pounds per sq. in.	Elongation in 2 inches, Per cent	Rockwell[1] hardness, "B" scale	Electrical conductivity
15 per cent cupro nickel..	85	15	..	45,000	30	...	8.17
20 per cent cupro nickel..	80	20	..	50,000	30	37.5	6.47
Super nickel tube.....	70	30	..	65,000	30	...	4.75
10 per cent nickel silver...	65	10	25	50,000	45	32	8.27
18 per cent nickel silver...	65	18	17	58,000	40	40	5.91
Ambrac	75	20	5	50,000	35	25	6.2

[1] 1/16 inch ball penetrator, 100 Kg. load.

Copper-Silicon: Everdur

Silicon added to copper makes a small group of alloys of great usefulness. These alloys are less than 10 years old in the commercial sense. The ductile compositions lie below 4 per cent silicon, but the commercially rolled and drawn metals seldom carry more than 3.25 per cent of silicon, usually with ¾ to 1 per cent of manganese. Silicon "hardens" or increases the strength of copper more, without sacrifice of other useful properties, than any of the other metallic additions. Sheets of Everdur, a well known

alloy of the type, containing 3 per cent silicon, 1 per cent manganese, annealed for drawing and forming, have tensile strengths of the order 55,000 to 65,000 pounds per square inch, elongations 30 per cent to 40 per cent in 8 inches. Cold drawn bar stock has a modulus of elasticity of 15,000,000. Tables IV and V present the physical tests of Everdur in the commercial tempers, forms and ranges in size.

TABLE IV
REPRESENTATIVE PHYSICAL TESTS OF EVERDUR

Fabricated Forms and Temper	Size, Inch	Yield point[1] per Pounds sq. in.,	Tensile strength per sq. in., Pounds	Elongation in 2 inches, Per cent	Reduction of area, Per cent	Brinell hardness Number	Conductivity, I.A.C.S. Per cent
Rods, cold drawn.	½	80,000	98,700	18.8	57.5	183	....
	1	76,000	96,400	20.5	44.0	179	....
	2	56,500	71,600	42.0	56.0	141	....
Rods, soft	½	14,800	54,300	87.5	83.0	60	....
	2½	24,700	56,100	81.0	75.0	87	....
Tubes, hard.....	1 O.D.	25,100	62,900	67.0	60.0	90	....
Tubes, soft.....	2 O.D.	14,100	52,800	92.0	66.0	59	....
Sheet, hard.....	.188	75,000	91,500	21.0	47.0	175	....
soft.....	.385	20,700	53,700	84.0	69.0	69	....
						Rockwell hardness[2]	
Sheet, ¼ hard...	.040	50,300	65,630	38.0	63.0	77	....
½ hard...	.042	58,330	69,730	32.0	56.0	86	....
hard...	.041	87,500	92,870	8.3	41.0	93	....
extra hard...	.041	95,530	103,870	5.5	33.0	97	....
spring...	.042	97,400	109,330	4.3	33.0	99	....
				in 10 inches			
Wire, soft	.367	25,000	58,800	49.7	...	...	6.7
½ hard...	.288	65,000	99,800	3.6	...	...	....
hard...	.230	85,000	125,170	2.4	...	...	6.2
extra hard...	.184	92,000	142,100	1.2	...	...	....
spring...	.123	95,000	148,550	4.6	...	...	....
				in 2 inches		Brinell	
Cast ingots.....	.722	30,300	55,810	22.3	22.6	103	....

[1] Yield point taken as the load producing an extension under stress of 0.75 per cent. [2] "B" scale, ⅛ inch ball, 100 Kg. load.

TABLE V
TENSILE STRENGTH ¼ INCH ROD AT ELEVATED TEMPERATURES

Temperature, Degrees F.	Ultimate per sq. in., Pounds	Elongation in 2 inches gauge length, Per cent	Reduction of area, Per cent
80	72,650	43.5	51.0
500	60,200	33.0	67.4
750	35,930	25.5	69.4
1,000	14,480	18.0	71.4

Everdur metal on repeated heating and cooling does not suffer any permanent growth.

The metal is easily worked hot or cold. It has found its way into all basic forms including plates, sheets, strip, rods, wire, pipe, forgings and castings. It welds better, probably, than any other non-ferrous metal and is joined by all common methods except hammer welding. Bolts are made by hot heading or cold heading. Threads may be cut or rolled. Full sized loading tests on threaded bolts taken at random from transmission line stocks gave values as follows:

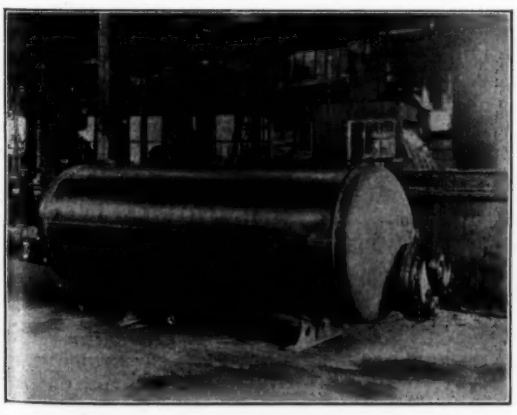

FIG. 6
A welded Everdur heater tank.

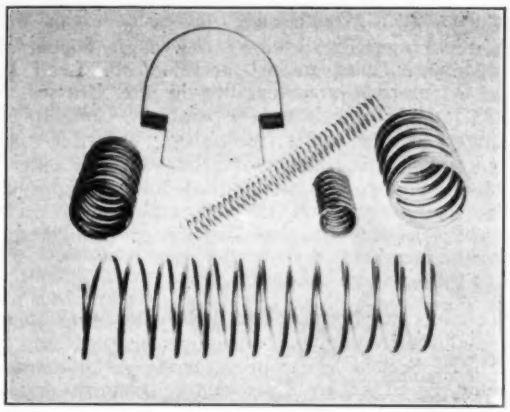

FIG. 7
Beryllium copper springs.

Type	Hot Headed Cut	Hot Headed Cut	Cold Headed Rolled	Cold Headed Rolled
Thread				
Size	⅜ inch	¾ inch	⅜ inch	¾ inch
Load, pounds per sq. in.	90,400	81,400	95,600	81,700
Yield point[1].....	39,800	35,800	68,700	31,400
Extension in 5 inches	2.7%	6.7%	0.47%	4.6%

[1] Yield point taken as load producing an extension of .75 per cent under stress. The load was applied to the heads and nuts.

The copper-silicon alloys are easily worked in the shop. Almost anything can be done with them that can be done with steel, often without change of tools. They are hardened, i. e., the tensile strength is increased by cold work just as is the case with the other copper alloys.

Fig. 6 is a welded tank made from Everdur plate, note the dished heads. Plates weighing 6,000 to 8,000 pounds are regularly rolled for tank work.

Copper-Beryllium

Beryllium copper is the newest commercial member of the copper alloy group. It is a true heat treating metal. The properties imparted to copper by the addition of 2¼ per cent beryllium and ¼ per cent of nickel are quite remarkable. Table VI briefly presents the facts.

TABLE VI
APPROXIMATE TENSILE PROPERTIES OF BERYLLIUM-COPPER SHEET
(2.00 to 2.25 per cent Beryllium, .050 inch ga.)

Condition	Yield point, Pounds per sq. in.	Tensile strength, Pounds per sq. in.	Elongation in 2 inches, Per cent	Brinell hardness, 10 mm. ball, 3000 kg. load
Soft annealed	31,000	70,000	45.0	110
Soft—average heat treatment	134,000	175,000	6.3	340
2 Nos. hard.....	90,000	103,000	8.0	200
2 Nos. hard—average heat treatment.....	132,000	173,000	4.8	340
4 Nos. hard.....	105,000	118,000	4.3	220
4 Nos. hard—max. heat treatment.....	138,000	193,000	2.0	365

Heat treatment of beryllium-copper is the opposite of that given to steel. Exposure to a high temperature (1560 deg. F.) followed by quenching softens it. Hardening is accomplished by holding at 500 to 575 deg. F. one-half hour to two hours, according to the work, and slowly cooling. The metal is one of the precipitation hardening type. Annealed beryllium-copper work hardens like any other copper alloy. This is a very convenient thing, for it is possible to select a temper suitable to a forming operation, such as making a spring or a clip, to make the article and then to heat treat for maximum strength or springiness. (Fig. 7 beryllium-copper springs) The metal has found a wide variety of uses in instrument manufacture, watches, for valve seats in aircraft engines, for welding electrodes, for non-sparking tools, and many others.

OTHER ALLOYING METALS:

The minor metallic additions to wrought copper alloys are important. Chief among them is *lead*. Lead serves mainly to improve machinability in the Brasses. The amounts range from .25 to 4.0 per cent. Common brass pipe carries .50 per cent, free cutting rods 2.50 to 3.75 per cent, free cutting phosphor bronze 4.0 per cent. The amount is suited to the need. Lead does not appreciably affect corrosion resistance. Lead does not dissolve in brass but remains as tiny droplets distributed throughout the mass of the metal.

ARSENIC:

Arsenic has long been used to slightly harden copper and to raise the softening and annealing temperatures. See Fig. 2. Fire refined lake copper carries variable amounts of arsenic, from .002 to .2 per cent according to brand.

IRON:

Iron is a hardener in small amounts but it is generally to be looked upon as an impurity with a detrimental influence on corrosion behavior.

ALUMINUM:

The copper-aluminum group of alloys is metallurgically like the copper-tin and other series. Aluminum is soluble in copper to about 10 per cent. The aluminum bronzes are high strength alloys that work harden very rapidly and are in consequence among the more difficult to manufacture. They are yellow to golden in color, notably resistant to corrosion and retain strength and hardness at elevated temperatures better than the other high copper alloys. Aluminum in amounts of 1 to 2 per cent improves the resistance of some brasses to oxidation pitting in sea water.

MANGANESE:

Manganese is primarily a deoxidizer that performs its functions in the melting casting stages. The common manganese bronzes are variations of the Muntz type of brasses carrying 0.10 to 0.50 per cent manganese together with .75 to 1.5 per cent each tin and iron. This is a popular metal for valve stems and for high strength forgings. A large variety of special purpose manganese bronzes have been made in Europe.

SILICON:

Silicon in small amounts is another deoxidizer that exerts an important influence on the behavior of metals at welding temperatures.

PHOSPHORUS:

Phosphorus may be classed with Silicon as a useful deoxidizer and auxiliary in welding rod alloys.

CADMIUM:

Cadmium-copper alloys carry from .50 to 1.25 per cent cadmium. They have good strengths and conductivities in hard drawn wires and ar used for long span transmission lines, rural power lines, and trolley wire. Cadmium-copper alloys also make excellent electric welding electrodes.

CORROSION OF COPPER ALLOYS:

Accurate information on the resistance of metals to corrosive attack by the chemicals used in industry is valuable but is not readily available. While actual field experience must always be the final criterion, laboratory tests form a good and inexpensive basis for comparing one metal with another under conditions that parallel field exposures. A few laboratory figures will be of interest.

SULPHUR DIOXIDE:

A group of tests, Table VII, were made to disclose the attack of moist Sulphur Dioxide gas and water saturated with sulphur dioxide at room temperature. Pure sulphur dioxide gas was used but in the presence of air and water it partially oxidized to sulphur trioxide. The samples therefore were actually attacked by mixed sulphurous and sulphuric acids. Parallel tests in dry sulphur dioxide gas were practically without effect even in the presence of air. The rates of attack are given in Table VII as penetration in inches per year and were calculated from loss in weight. The values are low. Copper, red brass and phosphor bronze showed good resistance. The 70:30 brass was slightly dezincified; while the 60:40 brass, leaded brass, Tobin bronze, and manganese bronze were more deeply dezincified. Temperature was not controlled but averaged 75 deg. F. The times of exposure were 6 weeks to moist gas and 2 weeks to water saturated with SO_2.

TABLE VII
CORROSION TESTS IN SULPHUR DIOXIDE

	Composition					Penetration, inches per year	
Materials	Copper	Zinc	Tin	Nickel	Lead	Moist SO_2 gas, 6 weeks	Water saturated SO_2, 2 weeks
Refinery copper...	99.977	....	....	....	....	.0002	.0007
Deoxidized copper	99.98	....	....	....	....	.0002	.0009
Red brass.....	85.25	14.70	....	....	....	.0005	.0012
70:30 brass	70.34	29.56	....	....	....	.0007	.00007
60:40 brass	59.69	40.25	....	....	....	.0009	.0004
Leaded brass.....	60.81	37.14	....	....	2.03	.0008	.0002
Phosphor bronze..	94.89	...	5.14	....	....	.0003	.0007
Tobin bronze.....	60.14	39.14	.71	....	....	.0008	.0002
				Iron	Mn		
Manganese bronze	58.71	39.37	.72	1.15	.05	.0011	.0002
				Nickel			
Ambrac	74.57	5.38	....	19.15	....	.0010	.0005

Another short time (5 day) test of copper and Ambrac, reported in Table VIII, compared the attack in a still atmosphere of moist sulphur dioxide gas, in water saturated with sulphur dioxide and in 5 per cent sulphuric acid saturated with sulphur dioxide, all at 75 deg. F.

TABLE VIII
PENETRATION INCHES PER YEAR

Material	Moist sulphur dioxide	Water saturated with sulphur dioxide	5 Per cent sulphuric acid saturated with sulphur dioxide
Refinery copper	.00005 inch	.001	.0015
Ambrac	.00005 inch	.0005	.0005

Everdur is brought into the list, Table IX, by a severe month long test in water saturated with sulphur dioxide at 80 deg. C. (176 deg. F.). The solution was stirred constantly.

TABLE IX

	Composition			Penetration,
Material	Copper	Silicon	Manganese	Inches per year
Refinery copper.....	99.952	...	..	.033
Deoxidized copper....	99.941	...	..	.016
Everdur	95.93	3.01	.89	.027

Small amounts of copper were taken up by the solutions, enough to color them.

The penetration figures of the alloys in each of the three tables are not directly comparable but may be compared through the medium of the copper samples. Differences in copper penetrations in one table and another are due in part to differences in test conditions and in part to magnification of very small errors in weighing. The longer such tests can be run the greater the accuracy and the more reliable the inferences drawn.

SALT AND ACID SPRAY TESTS:

Spray tests have been looked on favorably as a convenient accelerated corrosion test. Samples are set up in closed boxes and are kept in a fog of salt solution or dilute acid. A comparison of three metals tested for one month in sprays of 20 per cent salt, 5 per cent sulphuric acid and water saturated with sulphur dioxide is presented in Table X.

TABLE X

SPRAY TESTS—LOSS GRAMS PER SQUARE INCH PER MONTH

Material	20 Per cent salt spray	5 Per cent sulphuric acid spray	Water and sulphur dioxide spray
Copper	.0110	.0042	.0014
Low brass [1]	.0058	.0040	.0023
Phosphor bronze [2]	.0121	.0031	.0015

[1] Copper 80 per cent, zinc 20 per cent. [2] Copper 96 per cent, tin 4 per cent.

FIELD EXPOSURES:

Samples may be placed in pulp and paper mills in locations chosen for severity of exposure. One such test made in 1928 in a sulphite pulp mill is representative. Test pieces were suspended in the acid storage tank, the acid reclaiming tower, the acid make-up tower and the top of the digester, for suitable lengths of time. Upon removal they were examined, cleaned, weighed and tested. A summation of the effect upon tensile strength is contained in Table XI. The original test values are given on the top line. Tensile strengths or rather, breaking strengths of corroded samples, expressed as percentages of the originals appear through the body of the table.

Many more test results in other solutions and under other conditions might be presented. Enough has been said to indicate the sort of data obtainable and to afford a quick comparison of the several copper alloys. Those that are copper rich are less affected by sulphurous acid than those low in copper. This, broadly speaking, is true of sulphuric acid and many another reagent. Every mill corrosion problem should be considered by itself and questions regarding suitability of metals taken up with the metal manufacturers.

A few tables covering the adaptability of metals have been published. Probably the best was issued by the American Society for Testing Materials in 1930. It is a valuable guide for the engineer dealing with corrosion and heat resistance problems.

Types of Corrosion Attack

Corrosion attack on copper alloys resembles the attack on steel and on other metals in many cases but in others is quite different. All metals are subject to wastage, loss of weight by actual removal of metal from their surfaces, by the solvent action of acids, and by erosion. In some cases a corrosion product is redeposited in place. The formation of iron rust is familiar to all. When no redeposition accompanies solution, metal surfaces pit or roughen, the sheet or tube wall grows thinner to the point of perforation. Copper alloys generally behave in this way. Certain brasses are subject to two other peculiar forms of attack, dezincification and season cracking.

Dezincification is the name applied to a form of corrosion that takes place under some conditions and is peculiar to the high zinc brasses. It is in reality the redeposition in place of copper from the alloy which is first dissolved as a single substance. Dezincification is usually a slow process and is in effect a separation of copper from zinc in a dilute water solution. Under some conditions, ground waters charged with CO_2 for example, the high zinc brasses and zinc from brass are more soluble than copper. The alloy goes into solution, is resolved into its component metals, which thereupon behave as individual elements. Copper, being relatively insoluble, is precipitated at once. Zinc, being relatively soluble, is carried off. Chemical action undoubtedly plays its role in the drama, but it makes little difference in the net result if the zinc disappears from the scene as a carbonate, an oxide or some other compound. The Red Brasses, which are low in zinc, do not dezincify. No sharp line of demarcation can be drawn between those that do "dezincify" and those that do not, but experience has shown that the red brasses with 20 per cent or less zinc rarely dezincify. The red brasses should be used where experience with common brass indicates a tendency to this type of corrosion. Common brass, for example, is used for table rolls by several paper machine builders and with no little success, but in some mills common brass rolls dezincify and pit. Red brass should be used in such places instead. In fact, the brass maker prefers to supply red brass tubes to avoid the possibility of roughened surfaces. The common brasses and the others with more than 20 per cent of zinc serve excellently in a great many industries, particularly where they are not exposed to unusual corrosion from natural or industrial agencies.

Denzincification usually affects the entire exposed surface of the metal. Fig. 8 is a cross section showing the inner surface of a common brass water pipe (67 per cent copper) partially "dezincified." The attack is sometimes localized and is then spoken of as "plug type."

Dezincification should always be reported when it occurs in samples used for corrosion test. The loss of weight from loss of zinc alone is not a true measure of attack.

The single phase alpha brasses commonly dissolve over large areas at a uniform rate; even when pitting occurs the attack is over a broad front and with no regard for grain boundaries. Fig. 9. The Muntzes on the other hand are attacked selectively. Beta, the low copper constituent, is more easily dissolved than the higher copper alpha grains. In Fig. 10 the beta is clearly seen as are also the voids from which it has been dissolved leaving an open honeycombed mass of the more slowly attacked alpha crystals standing out. This brief discussion of corrosion behavior indicates why the yellow and common brasses are not recommended for pulp and paper mill use by responsible manufacturers and why the higher copper types and copper itself are.

SEASON CRACKING:

Season cracking is an intercrystalline weakening of hard

TABLE XI.—TENSILE PROPERTIES COPPER ALLOY SAMPLES—BEFORE AND AFTER EXPOSURE IN SULPHITE PULP MILL—EXPRESSED AS PER CENT

	Copper										
	Electrolytic	Deoxidized	Red Brass	70-30 Brass	60-40 Brass	5% Tin Bronze	10% Tin Bronze	Admiralty	Tobin Bronze	Ambrac	Everdur
TENSILE STRENGTH											
Before corrosion	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Pounds per sq. inch	34,000	36,330	44,200	47,550	58,450	53,750	64,430	50,100	68,500	56,350	72,350
Acid storage—32 days	100.	99.	99.	100.	88.	100.	100.	96.	92.	99.	100.
Reclaiming tower—31 days	100.	99.	100.	100.	73.	100.	98.	98.	92.	99.	98.
Acid make up tower—31 days	73.	71.	70.	67.	53.	62.	48.	57.	48.	73.	69.
Top of digester—12-14 days	74.	67.	68.	64.	37.	69.	78.	61.	(a)	59.	67.
ELONGATION											
Before corrosion	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Per cent in 1 inch	53.5	55.	50.	67.	51.5	57.	74.7	72.7	40.5	41.	51.6
Acid storage—32 days	100.	98.	100.	100.	89.	100.	98.	100.	86.	96.	100.
Reclaiming tower—31 days	100.	100.	100.	100.	80.	100.	99.	98.	78.	99.	100.
Acid make up tower—31 days	97.	98.	93.	98.	58.	83.	77.	87.	42.	93.	94.
Top of digester—12-14 days	69.	76.	74.	73.	43.	76.	95.	74.	(a)	62.	94.

(a) Samples corroded through at hole and lost.

drawn or cold rolled brasses and bronzes. It is not accompanied by loss of weight and it very seldom happens in brass that has been annealed even lightly. The higher copper brasses and phosphor bronzes are less susceptible than those rich in zinc or tin. In season cracking the corrodant makes its way deep into the metal between the crystals causing them to separate from one another. High internal stress in hard rolled metal or abrupt changes in internal stress favor the development of season cracking. Acids, ammonia, sulphides and mercury will season crack a hard drawn brass. The tendency for a brass to season crack is roughly proportional to the zinc content above a minimum of 15 per cent and to the cold worked hardness. Spring temper phosphor bronze tightly coiled, sometimes season cracks after long exposure in damp atmospheres. Annealing for relief of stress, even so lightly as not to reduce physical properties to any great degree, lessens the chance of season cracking. Mercurous nitrate testing of condenser tubes is an accelerated test for season cracking. Tubes that have been annealed are immune to failure of this kind.

Some alloy steels are susceptible to season cracking.

Red Brass

Two brass mill products should be mentioned in a discussion of paper mill materials, red brass and the fourdrinier alloys. Red brass, copper 80 to 85 per cent balance zinc, is familiar to paper men in high grade table rolls. It has not been used in quantity in pulp or paper making for other purposes. Elsewhere red brass pipe and seamless tube (85 percent copper, 15 per cent zinc) have found much favor for water and acid lines. The oil refineries in particular are using red brass pipe sizes 2 to 10 inches for carrying dilute sulphuric acid, acid sludges, etc., of a very corrosive nature. Red brass works well in the sheet, tube and wire mill and is therefore available in all commercial forms at cost but slightly above that of copper. Soft red brass pipe has higher strength than soft copper in the ratio of 42,000 pounds per square inch to 35,000 pounds per square inch. The advantage in commercially hard pipe is, however, much greater, i e., red brass 68,000 pounds per square inch, copper 50,000 pounds per square inch.

FIG. 9
Cross section of corrosion pit in Admiralty tube, 75×.

Fourdrinier Wire

Fourdrinier wire is made of low brass (high copper) of the 80 to 90 per cent type, or bronze of the 90 to 95 per cent type. Both these alloys possess the combination of tensile strength, ductility and wear resistance so necessary in woven screens. Fourdrinier wire is one of the brass wire mills' specialty products. It is not a stock article. The analysis and temper have to be very closely controlled and are, in fact, made to fit the customer's known needs. In no single brass product is close cooperation between wire mill, weaver and ultimate consumer necessary to any greater extent than in the manufacture of wire for fourdrinier screens. The properties of weaving wires .008 to

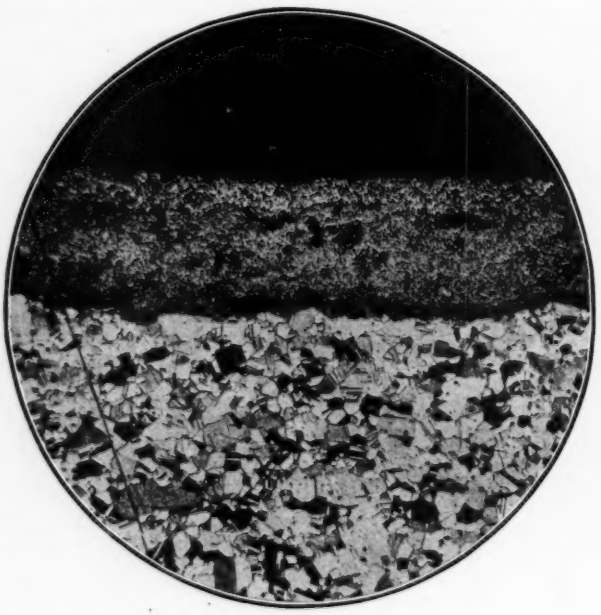

FIG. 8
Dezincification of common brass, 75×.

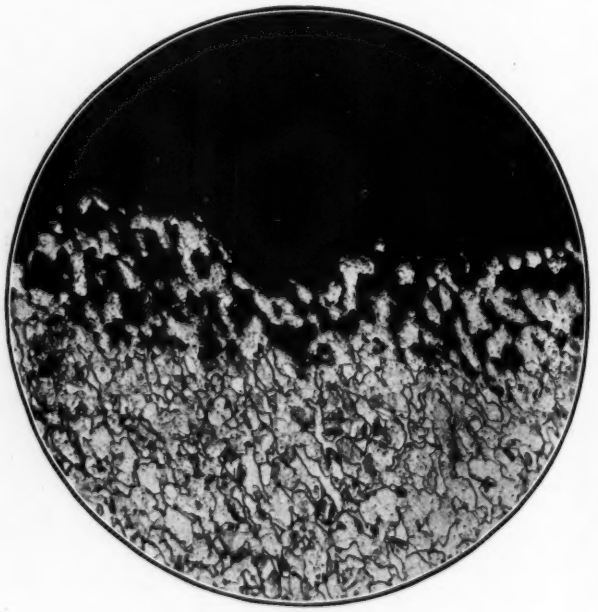

FIG. 10
Cross section corroded Muntz metal pipe, 75×.

.010 inch in diameter vary slightly. A .008 inch brass wire should test as follows:

Tensile strength	48,000 lbs. per square inch
Elongation	4½ inches in 12 inches (37½%)

These wires break under direct loads of slightly more than 2 pounds. Bronze of the same size is stronger, breaking close to 3 pounds. It speaks well for any manufacturer to be able to turn out uniform wire of these sizes and properties in carload lots. It is done, nevertheless, and with full understanding of the importance, fine quality and duty expected of the finished woven screen.

Summary

It is hoped that the foregoing paper has succeeded in describing the chemical and metallurgical properties of copper and its more common commercial alloys in such a manner that busy mill engineers and superintendents can readily obtain a birdseye view of the subject. Metallurgically speaking, copper and its alloys are simple metals to understand. They are free from the complex structures that result from the heating and cooling of steel. The control of properties is primarily one of the control of composition upon which it is possible to build by intelligent use of cold working and annealing. The art of making these metals is founded in antiquity, but the development of the present high degree of perfection is one of recent years. No metal working industry has been more profoundly affected by the introduction of electrical power than this one. We have seen the almost complete transformation of melting practice result from the invention of the induction furnace. Rolling mill construction, schedules and even annealing have been improved and modified by the use of electricity. The introduction of individual motor drives on all kinds of equipment has made possible, among other things, the heavy passes of a modern sheet mill and the development of an ingenious tube rolling machine by which the up to date tube mill breaks down extruded tubes to ready-to-finish sizes, to mention only two of the many mechanical improvements. Gas too, has played its part in the refinement of annealing furnace operation even extending to the control of atmospheres so that the work is not tarnished after being exposed to incandescent temperatures.

Chemists and metallurgists deserve much of the credit for the evolution of the copper industry in the last thirty years. They have established a precision control over the casting shop and the mill. They have developed extraordinary powers for taking alloys apart by chemical analysis and the spectrograph. They read structures with the microscope and X-rays. Man's understanding of metals has been expanded many fold by the use of such instruments of study. The end is not yet in sight. The day for making new alloys by simply adding a pinch of this to a pot of that has not quite passed but discoveries of the sort are more or less accidental. The hardened copper myth hangs on, but it is safe to say that among the hardened coppers which have been described or mentioned are to be found metals that transcend the fondest dreams of the ancients.

Report of Subcommittee on Chemical Methods*

The subcommittee on Chemical Methods of Paper Testing accomplished the following during the year 1935:

a—Methods completed, adopted by the Paper Testing Committee and the association as tentative standards:

T 434 m—Acid soluble iron in paper
T 436 m—Arsenic in paper
T 407 m—Amount of coating in mineral coated paper (revised method)

b—Methods completed and submitted to the Paper Testing Committee:

Tentative method for determination of zinc in paper containing zinc fillers.
Tentative method for analysis of ash of papers containing titanium pigments.

c—Methods under consideration and their status:

Revision of T 420 m, Starch in paper (quantitative)—A proposed method, involving the use of saliva for separating the starch from the paper has been submitted to the committee members and others interested. The majority of the replies indicates that this method is considered to be an improvement over the present one. As soon as the details regarding measuring the extracted starch are decided the method will be ready for final vote of the subcommittee.

Revision of T 416 m, Resin in paper—This method is now ready for the subcommittee's final vote.

Revision of T 406 m, Active sulphur in paper. It has been decided to retitle this method "Reducible sulphur in paper" and prepare a separate method for testing paper for its silver staining properties. The method for reducible sulphur is being voted upon by the subcommittee. Several methods for determining the silver staining properties of paper have been proposed. Before adopting any of these, they will need to be tested by some cooperative means. As soon as this is completed the subcommittee will be able to select the most satisfactory one. This work will probably be completed early next year.

Suggested Micro Chemical methods for alpha cellulose copper number and acidity—At the fall meeting the Council decided that any committee may recommend as a "Suggested Method," any method of analysis which it considers the best procedure available at the time, but which it does not consider advisable to be adopted as a tentative standard. Such a set of test methods for alpha cellulose copper number, and acidity to be used where the amount of sample for test is very small has been examined by subcommittee and voted to be submitted to the Paper Testing Committee. Accordingly the methods are being phrased to conform to association procedure and will be forwarded early this year.

Combination of all methods pertaining to analysis of paper ash into one comprehensive method—With the completion of the methods for zinc and titanium in paper ash the association will have four separate methods dealing with the determination of ash and its analysis. Obviously, these should be combined. At the same time methods T 421 and T 422 m can be revised to recognize the possible presence of sulphides, sulphites, lithopone, zinc or titanium. This work will be done in the coming year.

Methods for determining beta and gamma cellulose and pentosans—The request for these methods was received in the fall. The preliminary steps of collecting and correlating published data on these subjects is under way and will be continued next year.

The subcommittee takes this opportunity to thank all who throughout the year, on numerous occasions, have materially assisted the committee in its work.

P. F. Wehmer, Chairman,
Subcommittee on Chemical Methods
Electrical Testing Laboratories, New York, N Y

* To be presented at annual meeting of Technical Association of the Pulp and Paper Industry, Waldorf-Astoria Hotel, New York, N. Y., Feb. 17 to 20, 1936.

Delaware Valley Section of TAPPI Discusses Materials Handling

The Delaware Valley Section of the Technical Association of the Pulp and Paper Industry met at the Engineers Club in Philadelphia, Pa., Friday, January 31, 1936. About fifty members were present with Harvey P. Cannon, Chairman, presiding.

The speaker of the evening, James F. Downey, engineer of the Chas. E. Bedaux Company, New York City, spoke on the subject: "The Technique of Modern Material Handling Measurements."

Mr. Downey outlined the history of motion study work in factory and plant and the system originated by the man Bedaux, who, still living, has been accepted as an authority on proper application of human energy to production and industry. The description of the development of this unit of energy or work showed the intense analysis necessary to properly apply any results of motion study to an operation.

Actual cases were presented and illustrated with formula and figures to show the manner of applying an analysis to obtain the greatest output with minimum of available physical energy. There were also descriptions of mechanical changes brought about by time study to show that such work does not always bring improvement through personnel changes but by enlightening comparisons and glaring omissions. This the trained motion study engineer is best qualified for and the flexibility of the plan under which his principals are applied are just as important as the fundamental theory which establishes the measuring unit of work.

Outline of Methods

The methods found to be most successful are outlined as follows:

1. Preliminary survey of operation as in present use. Cooperation of management and supervisors who actually determine the most suitable process method and choice of equipment.

2. Actual measurement of operation as conducted and set up by the management.

3. Management with engineers to analyze the operation measurements. With this information further improvements are frequently made and operation is restandardized to eliminate waste energy.

4. Accurate recording of measurements to regularly control the job operation through continuous management use.

5. Use of continuous data as an aid in selecting new equipment or developing new process.

Those in Attendance

Those present were:

Those who attended were: R. E. Aiman, Norristown, Pa.; R. J. Atwater, Dill & Collins, Inc., Philadelphia; R. M. Bates, T. M. Royal & Co., Philadelphia; H. L. Becher, Agasote Millboard Company, Trenton, N. J.; J. H. Brougham, Penn Fibreboard Company, York; W. E. Brow, Container Corporation of America, Manayunk; C. M. Connor, Valley Forge Laboratories, W. Conshohocken; F. L. Connard, Reading Paper Mills, Reading; A. M. Cooper, Westinghouse Electric and Manufacturing Company, Philadelphia; J. C. Dieffenderfer, Paper Makers Chemical Corporation, Easton; Jacob Edge, Downingtown Manufacturing Company, Downingtown; E. R. Fricht, Container Corporation of America, Manayunk; J. H. Fritz, National Oil Products Company, Harrison, N. J., E. E. Gans, Container Corporation of America; G. R. Haggerson, Paper Makers Chemical Corporation, Easton; J. C. Harper, Jr., West Jersey Paper Manufacturing Company, Camden, N. J.; R. E. Harter, R. T. Vanderbilt Company, New York; A. S. Hall, Thwing-Albert Instrument Company, Philadelphia; J. H. Hazelwood, Barber Asphalt Company, Gloucester City, N. J.; A. C. Hazelwood, Keasbey Mattison Company; Ray Heil, Norristown, Pa.; H. F. Hoffmann, General Dyestuff Corporation, Philadelphia; C. J. Kern, Moore & White Company, Philadelphia; V. Jacobsen, National Aniline and Chemical Company, Philadelphia; Leslie Justice, Valley Forge Laboratories, Conshohocken, Pa.; G. E. Landt, Continental-Diamond Fibre Company, Bridgeport, Pa.; W. T. Marble, Container Corporation of America; R. W. Martin, Hercules Powder Company, Wilmington, Del.; G. B. Martin, General Dyestuff Corporation, Philadelphia; J. J. McDonald, Brown Company, New York; E. N. Poor, W. C. Hamilton Sons, Miquon, Pa.; S. D. Reynolds, Container Corporation of America, Philadelphia; C. W. Rivise, Philadelphia; J. Roslund, Moore & White Company, Philadelphia; J. Carl Schmidt, Du Pont Company, Philadelphia; H. C. Schwalbe, Dill & Collins, Inc., Philadelphia; C. C. Stewart, C. C. Stewart Paper Company, Philadelphia; H. H. Street, National Vulcanized Fibre Company, Yorklyn, Del.; L. M. Sutherland, Sloane-Blabon Corporation., Trenton, N. J.; B. M. Thomas, Container Corporation of America; F. W. Varde, Barber Asphalt Company, Gloucester City, N. J.; A. E. Waugh, U. S. Rubber Company, Philadelphia; E. N. Wennberg, Continental-Diamond Fibre Company, Bridgeport, Pa.; A. W. Wickham, Mac Andrews & Forbes Company, Camden, N. J.; F. E. Winslow, General Electric Company, Philadelphia, Pa.

Jeffrey Mfg. Co. Catalogues

The Jeffrey Manufacturing Company, Columbus, Ohio, has issued the following catalogues:

Materials Handling Equipment Parts. Catalogue 417 (400 pages). Covers chains, sprockets, transmission machinery; spiral conveyor, elevator and conveyor parts, along with all other Jeffrey materials handling equipment parts. Gives specifications and list prices; presents pictorially line of materials handling equipment engineered, manufactured and erected by the Jeffrey Company.

Materials Handling, Electric Vibrating Equipment of the Jeffrey-Taylor type is featured in the new Catalogue 610 (64 pages). Describes this equipment which has no mechanical wearing parts; gives specifications of the various types; deals extensively with typical installations covering feeding, screening, conveying, packing, cooling, drying and other handling operations.

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING FEBRUARY 1, 1936

CIGARETTE PAPER

H. H. Strauss, Sarcoxie, Bordeaux, 446 cs.; Liggett & Myers Tobacco Co., Pipestone County, Havre, 334 cs.; Champagne Paper Corp., Ile de France, Havre, 122 cs.

WALL PAPER

J. E. Bernard Co., Hamburg, Hamburg, 3 bls.; F. J. Emmerich, Hamburg, Hamburg, 3 bls.; F. J. Emmerich, Britannic, Liverpool, 1 cs.; W. H. S. Lloyd & Co., Alaunia, London, 6 bls.

NEWSPRINT

Walker Goulard Plehn Co., Hamburg, Hamburg, 71 bls.; Jay Madden Corp., Hamburg, Hamburg, 301 rolls; Jay Madden Corp., Scanyork, Kotka, 585 rolls; H. Reeve Angel & Co., Inc., Scanyork, Kotka, 247 rolls; ———, New York, Hamburg, 24 rolls; Perkins Goodwin & Co., New York, Hamburg, 383 rolls.

PRINTING PAPER

Perkins Goodwin & Co., Hamburg, Hamburg, 104 rolls; R. J. Saunders & Co., Berengaria, Southampton, 6 cs.; Phoenix Shipping Co., New York, Hamburg, 6 cs.; Dingelstedt & Co., New York, Hamburg, 25 cs.

WRAPPING PAPER

Lunham & Reeve, Inc., American Merchant, London, 12 bls.; Yardley & Co., American Merchant, London, 8 cs.

FILTER COMPOUND

P. H. Petry & Co., Hamburg, Hamburg, 30 bls.; P. H. Petry & Co., New York, Hamburg, 70 bls.

FILTER PAPER

C. Schleicher & Schull Co., Inc., Hamburg, Hamburg, 10 cs.; H. Reeve Angel & Co., Inc., Alaunia, London, 6 cs.

DRAWING PAPER

H. Reeve Angel & Co., Inc., Alaunia, London, 4 cs.

BARYTA COATED PAPER

Atlantic F'd'g Co., Hamburg, Hamburg, 8 cs.

METAL COATED PAPER

K. Pauli Co., Hamburg, Hamburg, 20 cs.; K. Pauli Co., New York, Hamburg, 44 cs.

SURFACE COATED PAPER

Gevaert Co. of America, J. Jadot, Antwerp, 1 cs.

TRANSFER PAPER

D. C. Andrews & Co., New York, Hamburg, 4 cs.

PHOTO PAPER

J. J. Gavin, Berengaria, Southampton, 6 cs.

DECALCOMANIAS

Sellers Transportation Co., New York, Hamburg, 10 cs.

TISSUE PAPER

Atlantic F'd'g Co., Hamburg, Hamburg, 9 cs.; W. J. Byrnes, Berengaria, Southampton, 5 cs.

PAPER TUBES

———, New York, Hamburg, 29 pkgs.

CARD BOARD

American Express Co., Hamburg, Hamburg, 60 cs.; International F'd'g Co., J. Jadot, Antwerp, 8 cs.; Phoenix Shipping Co., New York, Hamburg, 50 bls., 10 cs.

PAPER BOARD

J. P. Heffernan Paper Co., J. Jadot, Antwerp, 10 cs.

MISCELLANEOUS PAPER

Jay Madden Corp., Hamburg, Hamburg, 11 bbls.; Gatto Engraving Co., Kiyosumi Maru, Yokohama, 4 cs.; Corn Exchange Bank Trust Co., Kwansai Maru, Kobe, 29 cs.; Japan Paper Co., Pr. Harrison, Genoa, 8 cs.; Keller Dorian Paper Co., Pr. Harrison, Marseilles, 3 cs.; R. E. Thibaut, J. Jadot, Antwerp, 43 pkgs.; C. Asche & Co., J. Jadot, Antwerp, 4 cs.; Japan Paper Co., Ile de France, Havre, 1 cs.; Japan Paper Co., American Merchant, London, 1 cs.; National City Bank, New York, Hamburg, 70 bls.; Keuffel & Esser Co., New York, Hamburg, 44 cs.; Jay Madden Corp., New York, Hamburg, 26 bbls.

RAGS, BAGGING, ETC.

Amtorg Trading Corp., Hamburg, Hamburg, 1359 bls. rags; Irving Trust Co., Capulin, Manchester, 49 bls. new rags; J. T. Flannery, Inc., Sarcoxie, Havre, 18 bls. rags; Castle & Overton, Inc., Sarcoxie, Havre, 32 bls. rags, 50 bls. bagging; W. Steck & Co., Sarcoxie, Havre, 48 bls. strings; E. J. Keller Co., Inc., Sarcoxie, ———, 821 bls. rags; E. J. Keller Co., Inc., Pipestone County, ———, 87 bls. bagging; E. J. Keller Co., Inc., Pipestone County, ———, 13 bls. paper stock; J. T. Flannery, Inc., Pipestone County, Havre, 19 bls. rags; Banco Com'l Italiane Trust Co., Pipestone County, Havre, 39 bls. cotton waste; Bank of Manhattan Co., Pipestone County, Havre, 72 bls. rags, 51 bls. bagging; Irving Trust Co., Pipestone County, Havre, 104 bls. bagging; Irving Trust Co., Pipestone County, Havre, 25 bls. paper stock; ———, Britannic, Liverpool, 109 bls. rags; Manufacturers Trust Co., Kwansai Maru, Shanghai, 62 bls. cotton waste; W. R. Gtace & Co., Kwansai Maru, Shanghai, 200 bls. cotton waste; American Cotton Products Co., Kwansai Maru, Osaka, 100 bls. cotton waste; Manufacturers Trust Co., Kwansai

Maru, Osaka, 200 bls. cotton waste; O'Brien Padawer & Co., Pr. Harrison, Bombay, 100 bls. cotton waste; ———, Pr. Harrison, Bombay, 196 bls. rags; ———, Pr. Harrison, Bombay, 150 bls. cotton waste; American Over-Ocean Contract Co., Pr. Harrison, Bombay, 50 bls. cotton waste; E. J. Keller Co., Inc., Pr. Harrison, ———, 32 bls. rags; E. J. Keller Co., Inc., American Shipper, ———, 34 bls. bagging; Leigh Textile Co., American Shipper, Manchester, 21 bls. cotton waste; Royal Manfg. Co., American Shipper, Manchester, 100 bls. cotton waste; ———, Alaunia, London, 46 bls. rags; National City Bank, American Merchant, London, 28 bls. paper stock; Whaling Waste Products Co., Gerolstein, Antwerp, 66 bls. jute waste; E. J. Keller Co., Inc., Indep. Hall, ———, 358 bls. paper stock.

GLUE STOCK, ETC.

———, Hamburg, Hamburg, 205 bags bone glue; ———, Hamburg, Hamburg, 200 bags hide glue; Irving Trust Co., Capulin, Liverpool, 260 bags hide pieces; P. Muller, Pipestone County, Havre, 48 bls. glue stock; ———, Britannic, Liverpool, 1080 bags hide trimmings; ———, Pr. Harrison, Colombo, 214 bls. hide fleshings.

OLD ROPE

Banco Com'l Italiane Trust Co., Pipestone County, Havre, 46 coils; Manufacturers Trust Co., Pipestone County, Havre, 110 rolls; Manufacturers Trust Co., Alaunia, London, 65 coils.

CASEIN

———, Tekoa, Auckland, 258 bags; Chase National Bank, Sarcoxie, Bordeaux, 700 bags, 56,226 kilos; ———, Sarcoxie, Bordeaux, 400 bags, 30,000 kilos; National City Bank, Pipestone County, Dunkirk, 134 bags, 10,096 kilos; American & British Chemical Supplies, Pipestone County, Havre, 668 bags, 50,100 kilos; Chase National Bank, Ile de France, Havre, 287 bags.

WOOD PULP

E. J. Keller Co., Inc., Hamburg, ———, 334 bls. wood pulp, 50 tons; Bulkley Dunton & Co., Hamburg, ———, 318 bls. wood pulp, 50 tons; Bank of N. Y. Trust Co., Hamburg, Hamburg, 140 bls. wood pulp, 28 tons; Castle & Overton, Inc., Hamburg, Hamburg, 630 bls. wood pulp, 126 tons; Price & Pierce, Ltd., Scanyork, Stockhold, 150 bls. wood pulp, 25 tons; Gottesman & Co., Inc., Scanyork, Gdynia, 642 bls. wood pulp, 99 tons; ———, New York, Hamburg, 2667 bls. wood pulp, 400 tons; Castle & Overton, Inc., New York, Hamburg, 1510 bls. wood pulp, 302 tons; Bank of N. Y. Trust Co., New York, Hamburg, 460 bls. wood pulp, 112 tons.

WOOD PULP BOARDS

Jay Madden Corp., Scanyork, Kotka, 69 bls., 14 rolls; Griffin Rutgers, Inc., New York, Hamburg, 10 cs.

BOSTON IMPORTS

WEEK ENDING FEBRUARY 1, 1936

Royal Manfg. Co., Pipestone County, Dunkirk, 63 bls. cotton waste; W. Steck & Co., Pipestone County, Dunkirk, 50 bls. threads; Irving Trust Co., Pipestone County, Dunkirk, 78 bls. bagging; Union Trust Co., Pipestone County, Havre, 27 bls. new cuttings; Ayres W. C. Jones Co., Pipestone County, Havre, 39 bls. cotton waste; Irving Trust Co., Pipestone County, Havre, 121 bls. new cuttings; Irving Trust Co., Pipestone County, Havre, 74 bls. strings, 44 bls. bagging; T. D. Downing & Co., Pipestone County, Havre, 34 bls. rags; Oxford University Press, Britannic, Liverpool, 11 cs. printing paper; ———, Britannic, Liverpool, 790 bags hide cuttings; G. F. Malcolm, Inc., Britannic, Liverpool, 3 cs. tissue paper; F. S. Webster Co., Britannic, Liverpool, 17 cs. tissue paper; ———, Kwansai Maru, Yokohama, 4 cs. paper; E. J. Keller Co., Inc., Pr. Harrison, ———, 50 bls. rags; E. J. Keller Co., Inc., Quaker City, ———, 31 bls. paper stock; Gottesman & Co., Inc., Quaker City, Czecho-Slovakia, 1315 bls. wood pulp; Bulkley Dunton & Co., Wanja, ———, 5800 bls. wood pulp; Paper Makers Chemical Co., West Calaumb, Buenos Ayres, 417 bags casein, 25,020 kilos.

PHILADELPHIA IMPORTS

WEEK ENDING FEBRUARY 1, 1936

———, Capulin, Liverpool, 166 bls. bagging; ———, Sarcoxie, Havre, 186 bags casein, 15,229 kilos; Castle & Overton, Inc., Sarcoxie, Havre, 170 bls. rags; Castle & Overton, Inc., Sarcoxie, St. Nazaire, 72 bls. new cuttings; Castle & Overton, Inc., Sarcoxie, Bordeaux, 225 bls. rags; E. J. Keller Co., Inc., Sarcoxie, ———, 820 bls. rags; Congoleum Nairn Co., Augvald, Seville, 375 bls. rags; Lagerloef Trading Co., Scanyork, Kotka, 2600 bls. mechanical pulp, 520 tons; Lagerloef Trading Co., Scanyork, Kotka, 787 bls. wood pulp boards, 89 tons; Castle & Overton, Inc., Scanyork, Kotka, 402 bls. sulphite, 78 tons; J. W. Hampton, Jr. Co., Scanyork, Kotka, 438 rolls newsprint; Jay Madden Corp., Scanyork, Kotka, 194 rolls newsprint; F. L. Smidth & Co., Scanyork, Copenhagen, 566 bls. paper bags; Gottesman & Co., Inc., Chemnitz Czecho-Slovakia, 648 bls. wood pulp.

BALTIMORE IMPORTS

WEEK ENDING FEBRUARY 1, 1936

Congoleum Nairn Co., Sarcoxie, Havre, 1223 bls. rags; Congoleum Nairn Co., Sarcoxie, St. Nazaire, 664 bls. rags; Certainteed Products Co., Sarcoxie, St. Nazaire, 195 bls. rags; Certainteed Products Co., Sarcoxie Bordeaux, 58 bls. rags; Congoleum Nairn Co., Sarcoxie, Bordeaux, 914 bls. rags; Bulkley Dunton & Co., Karpfanger, ———, 4685 bls. wood pulp; Bulkley Dunton & Co., Dagrun, ———, 1750 bls. wood pulp; Parsons & Whittemore, Inc., Taurus, ———, 3300 bls. wood pulp; Parsons & Whittemore, Inc., City of Norfolk, ———, 40 bls. wood pulp.

NORFOLK IMPORTS

WEEK ENDING FEBRUARY 1, 1936

E. J. Keller Co., Inc., Capulin, ———, 39 bls. bagging; E. J. Keller Co., Inc., Edgehill, ———, 73 bls, bagging; ———, Capulin, Liverpool, 66 bls. bagging; Castle & Overton, Inc., Sarcoxie, Havre, 108 bls. bagging; N. Y. Trust Co., Sarcoxie, Havre, 200 bls. bagging.

NEWPORT NEWS IMPORTS

WEEK ENDING FEBRUARY 1, 1936

Bulkley Dunton & Co., Consul Olsson, ———, 4142 bls. wood pulp.

NEW ORLEANS IMPORTS

WEEK ENDING FEBRUARY 1, 1936

Parsons & Whittemore, Inc., Ingram, ———, 667 bls. wood pulp.

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, February 5, 1936.

Conditions in the local paper market are satisfactory. Demand for the various standard grades of paper continues fairly brisk. Sales forces of the leading paper organizations are conducting a strenuous campaign for orders, with every confidence in the future outlook. Prices are generally holding to schedule.

The newsprint paper market is showing signs of impovement. Production in the United States, Canada and Newfoundland is being maintained in sufficient volume to take care of current requirements. Stocks at the mills are not excessive. While contract quotations remain unchanged the spot position is firmer.

Sentiment in the fine paper market is fairly optimistic. Demand for book, bond, cover and ledger papers is persistent for the time of year. Tissues are moving into consumption at a steady pace. The coarse paper market is exhibiting a strong undertone. Paper board mills are speeding production following the inventory period.

Mechanical Pulp

The ground wood pulp market is firmer. Manufacturing operations in North America and abroad continue to be keyed to consumption and there are no undue accumulations at the pulp mills. Quotations on foreign pulp are higher. No. 1 imported mechanical pulp is now selling at $22 to $23 per ton, on dock, Atlantic ports.

Chemical Pulp

Business in the chemical pulp market is excellent for the season. Imported kraft pulp is very firm, due to scarcity of offerings. No. 1 foreign kraft pulp is now quoted at $1.80 to $1.95 and No. 2 at $1.65 to $1.75, on dock, Atlantic ports. Orders are being booked for 1937 delivery. Bleached sulphite is also displaying greater strength.

Old Rope and Bagging

The old rope market is stronger, due to scarcity of offerings. Quotations on domestic and foreign old manila rope are firmer. Mixed strings are fairly steady. The bagging market has experienced no radical changes. Scrap and gunny bagging are holding up well, while roofing bagging is in good request for the season.

Rags

Steadiness prevails in the domestic rag market. New cotton rags are attracting more mill interest, including No. 1 white shirt cuttings, fancy shirt cuttings, etc. Export inquiries for No. 1 white shirt cuttings are fairly numerous, some of which should materialize into good orders. Roofing grades are stronger than of late.

Waste Paper

The paper stock market is sharing the general business improvement. Board mill demand for the lower grades of paper stock is better. Offerings are limited, however, due to the fact, that collections have been retarded through adverse weather conditions, and prices are firmer. Strictly folded news has been advanced $1 per ton and is now quoted at .35 to .37½.

Twine

Demand for the various varieties of twine is mainly along routine lines. The trend of the local market, however, is uncertain, due to the recent AAA tax decision of the Supreme Court. Many details and pending questions have arisen and until these are clarified it will be difficult to predict the future trend of the market.

New Shade Cards for Paper

The Geigy Company, Inc., dyestuff manufacturers, 89-91 Barclay street, New York, has just made two important shade card releases. These include colors for unbleached stock and coated papers. In the card of colors for unbleached stock all dyeings are on the basis of 1000 pounds stock on a finish of 50 ground wood and 50 unbleached sulphite, sized with rosin and alum. The group of colors recommended for clay and mica coated papers was selected for their better light fastness and adaptability for this class of papers.

Mills who have not as yet received these new shade cards may obtain them on application to the Geigy Company.

Articles Filed by Paper Tube Firm

MENASHA, Wis., January 30, 1936—A copy of the articles of organization of the Mack Paper Tube and Core Company, Menasha, has been received for record by George B. Young, register of deeds.

It is the stated purpose of the new company to manufacture paper tubes, paper cores, paper cans and other paper and fiber products, and to buy and sell paper products at wholesale or retail.

The capital stock of the corporation is to be $10,000, consisting of 100 shares. Provision is made for offices of president, vice president, secretary and treasurer and a board of directors of three stockholders.

Those forming the corporation are J. W. McLaughlin, Ethel S. McLaughlin and Ambrose Owen, all of Neenah.

Hard Wound Embossed Toilet Rolls

The Paper Converting Machine Company, Green Bay, Wis., manufacturers of paper converting machinery, has just completed and installed a machine for making hard wound embossed toilet paper rolls. Operations are all on one machine, and little, if any, embossing is taken from the sheet in the winding operation.

It makes a very compact roll, the 1000 sheet roll being from 4½ to 4 ¾ inches in diameter. This is considered a compact roll when compared to the soft wound embossed roll that is much larger in diameter.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, February 5, 1936.

BLANC FIXE.—Trading in the blanc fixe market is moderately active. Prices are holding to schedule. The pulp is quoted at $42.50 to $45 per ton, in bulk; while the powder is selling at 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER.—The bleaching powder market is rather quiet at present. Shipments against contract are moving in fairly good volume. Prices remain unchanged. Bleaching powder is quoted at $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN.—The casein market is firm. Domestic standard ground is quoted at 15 and finely ground at 15½; Argentine standard ground at 14¼ and finely ground at 14½; French standard ground at 14¼ and finely ground at 14½ cents per pound, in bags, car lot quantities.

CAUSTIC SODA.—Contract shipments of caustic soda are moving regularly. Prices are holding to formerly quoted levels. Solid caustic soda is selling at $2.55 to $2.60; while the flake and ground are offered at $2.95 to $3 per 100 pounds, in drums, at works.

CHINA CLAY.—The China clay market is fairly active. Shipments against contract are moving freely. Prices are steady. Imported China clay is quoted at $13.50 to $21 per ton, ship side; while domestic paper making clay is selling at $6.50 to $12 per ton, at mine.

CHLORINE.—Steadiness prevails in the chlorine market. The contract movement is well up to average. Prices are holding to schedule without difficulty. Chlorine is quoted at $2.15 to $2.55 per 100 pounds, in tanks, or multi-unit cars, at works.

ROSIN.—The rosin market is slightly irregular. Paper making gum rosin is quoted at $4.25 and wood rosin at $4.25 per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent rosin size is selling at $2.51 per 100 pounds, in tank cars, at works.

SALT CAKE.—Paper mill demand for salt cake is fairly persistent. Contract shipments are normal. Prices are steady. Salt cake is quoted at $12 to $13; chrome salt cake at $11 to $12 per ton, at works. Imported salt cake is selling at $12 to $13 per ton, ship side.

SODA ASH.—The soda ash market is fairly buoyant. Supplies are moving into consumption in good volume. Prices continue steady. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.05; in bags, $1.20; and in barrels, $1.50.

STARCH.—Conditions in the starch market are fairly satisfactory. Paper mill demand is moderately active. The price situation is unchanged. Special paper making starch is quoted at $3 per 100 pounds, in bags, and at $3.27 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—The sulphate of alumina market is in a sound position. Demand continues fairly persistent. Prices are steady to firm. Commercial grades are quoted at $1.35 to $1.50 and iron free at $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market is steady. Sulphur is quoted at $18 per long ton on orders of 1,000 tons, or over, on yearly contracts, and $20 per ton on any smaller quantity. On spot and nearby car loads, the quotation is $21 per ton. All prices at mine.

TALC.—Most of the business transacted in the local talc market during the past week was routine. Prices remain unchanged. Domestic talc is quoted at $16 to $18 per ton, at eastern mines, while imported talc is selling at $23 to $30 per ton, on dock.

Market Quotations

Paper

Rag Content Bond & Ledgers— Delivered Zone 1	Bonds	Ledgers
100% Rag Ext. No. 1	.36	.37
100% Rag	.28	.29
75% Rag	.21	.22
65% Rag	.18	.19
50% Rag	.15	.16
25% Rag	.12½	.13½

Sulphite Bond & Ledgers— Delivered Zone 1	Bonds	Ledgers
No. 1 Sulphite	7.75	8.75
No. 2 Sulphite	6.75	7.75
No. 3 Sulphite	6.00	7.00
No. 4 Sulphite	5.50	6.50

Book, Cased—			
S. & S. C.	5.35	@	5.75
S. & S. C. Litho.	5.60	@	6.00
M. F.	5.10	@	5.50
Coated and Enamel	5.90	@	6.55
Coated Litho	5.90	@	6.55
Tissues—Per Ream—			
White No. 1	.82½	@	—
White No. 1 M. G.	.77½	@	—
White No. 1½	.62½	@	—
White No. 2	.60	@	—
Anti-Tarnish M. G.	.67½	@	—
Colored	.80	@	—
Kraft	.67½	@	—
Manila	.60	@	—
Unbleached Toilet	2.60	@	3.30
Bleached Toilet	3.94	@	5.26
Paper Towels—			
Unbleached	2.10	@	3.35
Bleached	3.30	@	3.70
Manila—			
No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00
Fibre Papers—			
No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75

(Delivered New York)

News, per ton—			
Roll, contract	41.00	@	—
Sheets	46.00	@	—
Kraft—			
No. 1 Northern	4.12½	@	4.75
Standard	4.00	@	—
Southern	3.87½	@	—
Boards—per ton—			
News	37.50	@	—
Chip	37.50	@	—
Sgl. Mla. Ll. Chip	42.50	@	45.00
Jute Lined Chip	42.50	@	45.00
Kraft Liners	57.50	@	60.00
White Patent Coated	55.00	@	57.50
Binders Boards	67.00	@	75.00

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—		
Moist	22.00	@23.00
Dry	22.00	@23.00
(F. o. b. Mill)		
No. 1 Domestic and Canadian	18.00	@24.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Division 1	2.60	@	2.90
Division 2	2.55	@	—*
Division 3	2.50	@	—*
Prime Qualities—			
Class 1. All Prime Easy Bleaching	2.05	@	—*
Other Than Easy Bleaching—			
Class 2. Higher than Standard	2.00	@	—*
Class 3, Standard	1.95	@	—*
Class 4, Lower than Standard	1.90	@	—*
(On Dock, Atlantic Ports)			
Kraft No. 1	1.80	@	1.95
Kraft No. 2	1.65	@	1.75
(F. o. b. Pulp Mill)			
Kraft Domestic	1.75	@	1.80
(Delivered)			
Soda Bleached	2.50	@	—

* Add 60 Cents per short ton, dock charges, for Albany; $2.00 for Lake Ports East and $3.00 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	7.50	@	7.75
Silesias No. 1	5.25	@	5.50
New Unbleached	8.00	@	8.25
New Soft Blacks	3.75	@	4.00
Blue Overall	5.75	@	6.00
Fancy	2.75	@	3.00
Washables	2.00	@	2.25
Mixed Khaki Cuttings	3.25	@	3.50
O. D. Khaki Cuttings	4.00	@	4.25
Men's Corduroy	2.00	@	2.25
New Mixed Blacks	2.75	@	3.00

Old Rags

White, No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.75	@	3.25
White, No. 2—			
Repacked	1.75	@	2.25
Miscellaneous	1.50	@	1.75
Thirds and Blues—			
Repacked	1.75	@	1.85
Miscellaneous	1.45	@	1.55
Roofing Rags—			
No. 1	1.55	@	1.60
No. 2	1.35	@	1.40
No. 3 (bagging)	1.20	@	1.30
No. 4	.95	@	1.00
No. 5A	.90	@	1.00

Foreign Rags

New Rags

New Dark Cuttings	2.00	@	2.25
New Mixed Cuttings	1.80	@	1.90
New Light Silesias	3.75	@	4.00
Light Flannelettes	4.00	@	4.25
New White Cuttings	6.50	@	6.75
New Light Oxfords	3.25	@	3.50
New Light Prints	2.75	@	3.00

Old Rags

No. 1 White Linens	7.50	@	8.00
No. 2 White Linens	6.50	@	7.00
No. 3 White Linens	4.50	@	5.00
No. 4 White Linens	2.25	@	2.50
No. 1 White Cotton	4.25	@	4.75
No. 2 White Cotton	3.25	@	3.75
No. 3 White Cotton	2.50	@	2.75
No. 4 White Cotton	1.90	@	2.15
Extra Light Prints	2.00	@	2.25
Ord. Light Prints	1.75	@	1.85
Med. Light Prints	1.55	@	1.65
Dutch Blue Cottons	2.00	@	2.25
French Blue Linens	2.30	@	2.40
German Blue Linens	2.15	@	2.25
German Blue Cottons	1.70	@	1.80
Checks and Blues	1.70	@	1.80
Linsey Garments	1.95	@	2.05
Dark Cottons	1.50	@	1.60
Old Shopperies	1.00	@	1.05
New Shopperies	1.25	@	1.35
French Blues	2.00	@	2.25

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.20	@	2.25
Domestic	2.15	@	2.20
Wool Tares, light	1.75	@	2.00
Wool Tares, heavy	2.25	@	2.35
Bright Bagging	1.75	@	1.80
Manila Rope—			
Foreign	2.35	@	2.40
Domestic	2.25	@	2.30
Mixed Strings	.85	@	1.00
New Burlap Cut	2.00	@	2.25
Hessian Jute Threads—			
Foreign	2.60	@	2.75
Domestic	2.80	@	3.00

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.55	@	2.65
Ordinary Hard White No. 1	2.20	@	2.30
Hard White No. 2	2.05	@	2.15
Soft White No. 1	2.00	@	2.10
Flat Stock—			
Stitchless	.65	@	.75
Over issue Mag.	.65	@	.75
Solid Flat Book	.55	@	.60
Crumpled No. 1	.35	@	.40
Solid Book Ledger	1.50	@	1.65
Ledger Stock	.85	@	.90
New B. B. Chips	.30	@	.35
Manilas—			
New Env. Cut	1.70	@	1.80
New Cuttings	1.35	@	1.45
Bogus Wrapper	.40	@	.50
Old Kraft Machine—			
Compressed bales	1.20	@	1.30
News—			
No. 1 White News	1.45	@	1.50
Strictly Overissue	.50	@	.55
Strictly Folded	.35	@	.37½
No. 1 Mixed Paper	.25	@	.27½

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Twines

(F. o. b. Mill)

(Soft Fibre)

Coarse Polished—

India	.13¼	@	.15¾
Belg. White Hemp	.14¼	@	.17¾
India Compress	.13¾	@	.14¼

Fine Polished—

Fine India	.21½	@	.23½
Special	.19½	@	.21½

Unpolished—

Box	.12	@	.12½
Paper Makers	.09	@	.13½
Tube Rope	.10	@	.15½
Wall Paper	.11	@	.14½
Wrapping	.15½	@	.21
Special	.15	@	.15½
Soft Fiber Rope	.12½	@	.12¾

(Hard Fibre)

Bond	.12	@	.20½
Anchor	.11½	@	.13
Manila	.21	@	.2[illegible]

CHICAGO

Paper

(F. o. b. Mill)

Rag Bond	.12	@	.40
Water Marked Sulphite Bond	.06¾	@	.11
Sulphite Bond	.05½	@	.07¼
Superfine Writing	.18	@	.24
No. 1 M. F. Book	.06½	@	.07¾
No. 2 M. F. Book	.05¾	@	.06½
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07	@	.12
Coated Label	.07	@	.08½
No. 1 Manila	.04¼	@	.05¾
No. 1 Fibre	.04¾	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.03¾	@	.03¾
No. 1 Kraft	4.75	@	5.00
Southern Kraft	3.88	@	4.25
No. 2 Kraft	3.88	@	4.25
Wood Tag Boards	.04¼	@	.06¼
Sulphite Screenings	.03	@	.03¼
Manila Tissue	.05¾	@	.07
White Tissue	.07	@	.09

(Delivered Central Territory)

News, per ton—			
Rolls, contract	42.00	@	—
Sheets, open	47.00	@	—
Boards, per ton—			
Plain Chip	46.50	@	—
Solid News	50.00	@	—
Manila Lined Chip	55.00	@	—
Patent Coated	65.00	@	—
Container Lined—			
85 Test, per 1000 sq. ft.			1.70
100 Test, per 1000 sq. ft.			1.85

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings	1.70	@	2.00
No. 1 Hard White	1.40	@	1.65
No. 1 Soft White	1.25	@	1.50
Ledger & Writings	.70	@	.80
Solid Books	.60	@	.70
Blanks	1.00	@	1.05
Krafts	.80	@	.90
New Kraft Cuts	1.20	@	1.30
Manila Env. Cuts	1.25	@	1.30
Ex. No. 1 Manila	.90	@	1.00
Print Manila	.40	@	.50
Overissue News	.40	@	.45
Old Newspapers—			
No. 1	.30	@	.35
No. 1 Mixed Paper	.25	@	.30
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper

Rag Content Bond & Ledgers—Delivered Zone 1

	Bonds	Ledgers
100% Rag Ext. No. 1	.36	.37
100% Rag	.28	.29
75% Rag	.21	.22
65% Rag	.18	.19
50% Rag	.15	.16
25% Rag	.12½	.13½

Sulphite Bond & Ledgers—Delivered Zone 1

	Bonds	Ledgers
No. 1 Sulphite	7.75	8.75
No. 2 Sulphite	6.75	7.75
No. 3 Sulphite	6.00	7.00
No. 4 Sulphite	5.50	6.50

F.o.b. Mill

Book, M. F.	5.00	@	—
Book, S. S. & C.	5.25	@	—
Book, Coated	6.15	@	—
Coated Lithograph	6.15	@	—
No. 1 Jute Manila	10.50	@	—
Manila Sul., No. 1	6.75	@	—
Manila No. 2	4.25	@	—
No. 1 Kraft	6.00	@	—
Southern Kraft	5.00	@	—
News Print Rolls	40.00	@	—
Straw Board	40.00	@	45.00
News Board	40.00	@	—
Chip Board	37.50	@	—
Wood Pulp Board	70.00	@	85.00
Binder Boards—			
No. 1, per ton	75.00	@	80.00
No. 2, per ton	70.00	@	75.00
Carload lots	65.00	@	70.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1.	.07	@	.07½
New White, No. 2.	.05	@	.05½
Light Silesias	.04½	@	.05½
Silesias, No. 1	.04	@	.04½
Black Silesias, soft.	.03	@	—
New Unbleached	.06½	@	—
Washable, No. 1	.02	@	.02½
Blue Overall	.05	@	.05½
Cottons—According to grades—			
Washable, No. 2	.02½	@	.04¼
New Blue	.02	@	.02½
Fancy	.02	@	.02½
New Black Soft	.04¼	@	.04¾
New Light Seconds	.04	@	.04¼
New Dark Seconds	1.50	@	—
Khaki Cuttings—			
No. 1 O. D.	.04	@	.04½
No. 2 Mixed	.03½	@	.04½
Corduroy	.02	@	.02¼
New Canvas	.04	@	.04½
New Black Mixed.	.02¼	@	.02½

Domestic Rags (Old)

White No. 1—			
Repacked	4.00	@	4.50
Miscellaneous	3.00	@	3.50
Thirds and Blues—			
Miscellaneous	1.75	@	2.00
Repacked	2.50	@	2.75
Black Stockings (Export)	4.50	@	5.00
Roofing Stock—			
Foreign No. 1	1.75	@	1.80

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	2.00	@	—
Domestic	2.25	@	—
Manila Rope	2.75	@	3.00
Sisal Rope	1.75	@	2.00
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1	2.00	@	2.50
No. 2	.90	@	1.00
Wool Tares, heavy	3.00	@	3.25
Mixed Strings	1.00	@	1.10
No. 1 New Light Burlap	3.00	@	3.50
New Burlap Cuttings	2.50	@	2.75

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.25	@	2.30
No. 2 Hard White	1.90	@	2.00
No. 1 Soft White	1.80	@	1.85
No. 2 Soft White	1.25	@	1.30
No. 1 Mixed	—	@	.75
Solid Ledger Stock	1.50	@	1.60
Writing Paper	1.00	@	1.10
No. 1 Books, heavy	.55	@	.60
No. 1 New Manila	1.50	@	—
Print Manila	.50	@	.60
Container Manila	—	@	.50
Old Kraft	1.00	@	—
No. 1 Mixed Paper	—	@	.30
Straw Board Chip	.40	@	—
Binders Board Chip	.40	@	—
Corrugated Board	.55	@	—
Overissue News	.60	@	—
Old Newspapers	.40	@	—

BOSTON

Paper

Rag Content Bond & Ledgers—Delivered Zone 1

	Bonds	Ledgers
100% Rag Ext. No. 1	.36	.37
100% Rag	.28	.29
75% Rag	.21	.22
65% Rag	.18	.19
50% Rag	.15	.16
25% Rag	.12½	.13½

Sulphite Bond & Ledgers—Delivered Zone 1

	Bonds	Ledgers
No. 1 Sulphite	7.75	8.75
No. 2 Sulphite	6.75	7.75
No. 3 Sulphite	6.00	7.00
No. 4 Sulphite	5.50	6.50

F.o.b. Mill

Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06¼
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04¾	@	.05
No. 2 Kraft	.04½	@	.04¾

(F. o. b. Boston)

Southern Kraft	.03¾	@	.04½

(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots)

(Delivered New England points)

News Print Rolls	39.50	@	—
Straw Board, rolls.009	—	@	35.00
Filled News Board	40.00	@	45.00
Chip Board	37.50	@	40.00
Single Manila Lined Chip	47.50	@	52.50
Single White, Patent Coated News Board (Bender)	55.00	@	65.00
Wood Pulp Board	70.00	@	75.00
Binder Boards (Standard Grade)	67.00	@	75.00

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.00	@	2.20
No. 1 Soft White	1.75	@	1.90
No. 2 Mixed	.75	@	.80
Solid Ledger Books	1.40	@	1.50
Overissue Ledger Stock	1.15	@	1.30
Mixed Ledgers	.85	@	.90
No. 1 Books, heavy	.55	@	.65
No. 1 Books, light	.50	@	.60
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.60	@	1.70
No. 1 Old Manila	.60	@	.65
White Blank News	1.30	@	1.35
No. 1 Kraft	1.10	@	1.15
Mixed Papers	.22½	@	.25
Print Manila	.50	@	.60
Container Manilas	.27½	@	—
Old Newspaper	.27½	@	.30
Overissue News	—	@	.40
Box Board Chips	—	@	.25
Corrugated Boxes	.35	@	.40
Kraft corrugated boxes	.95	@	1.00
Screening Wrappers	.40	@	.45

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	2.40	@	2.50
Domestic	2.40	@	2.50
Transmission Rope	1.45	@	1.25
Jute Rope	2.00	@	2.25
Jute Carpet Threads	1.00	@	1.10
Gunny No. 1—			
Foreign	2.15	@	2.25
Domestic	1.90	@	2.10
Bleachery Burlap	4.00	@	4.50
Scrap Burlap—			
Foreign	2.20	@	2.35
Domestic	1.90	@	2.10
Scrap Sisal	2.00	@	2.25
Scrap Sisal for Shredding	2.25	@	2.50
Wool Tares, heavy	2.25	@	2.35
New Burlap Cuttings	2.25	@	2.35
Australian Wool Pouches	3.15	@	3.30
Heavy Baling Bagging	2.50	@	2.75
Paper Mill Bagging	1.75	@	2.00
Bagging No. 2	1.25	@	1.50

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.01¼	@	.02
New White No. 1	.06¾	@	.07
New White No. 2	.04	@	.04¼
Silesias No. 1	.04¾	@	.05
New Black Silesias	.02½	@	.03
Soft Unbleached	.06¾	@	.07
Blue Cheviot	5.25	@	5.50
Fancy	.02½	@	.02¾
Washable	.0165	@	.0170
Cottons—According to grades—			
Blue Overalls	5.50	@	6.00
New Black, soft	.04	@	.04¾
Khaki Cuttings	.04	@	.04¼
O. D. Khaki	.04	@	.04¼
Corduroy	.01¾	@	.02
New Canvas	—	@	.05
B.V.D. Cuttings	—	@	.06¾

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues	1.50	@	2.00
Thirds and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.62½
Black Stockings	2.50	@	3.00
Roofing Stock—			
No. 1	1.60	@	1.70
No. 2	1.40	@	1.50
No. 3	1.00	@	1.10

Foreign Rags

(F. o. b. Boston)

Dark Cottons	1.85	@	1.90
New White Shirt Cuttings	6.50	@	6.75
Dutch Blues	2.25	@	2.50
New Checks & Blues	2.50	@	3.00
Old Fustians	1.90	@	2.00
Old Linsey Garments	2.25	@	2.50
New Silesias	4.75	@	5.25

TORONTO

Paper

(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.11	@	—
No. 2 Sulphite	.08½	@	—
No. 1 Colored	.12	@	—
No. 2 Colored	.09	@	—
Ledgers (sulphite)—			
Ledgers, No. 1	.34½	@	—
Ledgers, No. 2	.25½	@	—
Writing	.09	@	.09½
Book—			
No. 1 M. F. (Carloads)	6.50	@	—
No. 2 M. F. (Carloads)	6.00	@	—
No. 3 M. F. (Carloads)	6.00	@	—
No. 1 S. C. (Carloads)	7.00	@	—
No. 2 S. C. (Carloads)	6.50	@	—
No. 3 S. C. (Carloads)	6.50	@	—
No. 1 Coated and Litho	12.00	@	—
No. 2 Coated and Litho	10.50	@	—
No. 3 Coated and Litho	9.50	@	—
Coated tinted	13.00	@	—
Wrapping—delivered—			
Rag Brown	4.75	@	—
White Wrap	3.50	@	—
"B" Manila	3.25	@	—
No. 1 Manila	3.40	@	—
Fiber	3.40	@	—
Kraft, M. F.	3.90	@	—
Kraft, No. 2	3.40	@	—

(F. o. b. Cars Toronto)

News, per ton—			
Rolls (contract)	39.50	@	—
Sheets	44.50	@	—

Pulp

Ground wood	27.00	@	—
Unbleached Sulphite	42.00	@	—
Book (Class 1)	58.00	@	—
Writing (Class 2)	59.00	@	—
Select (Class 3)	60.00	@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.00	@	2.25
Soft White	1.60	@	1.90
White Blk. News	1.25	@	1.40
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90	@	1.00
Light and Crumpled Book Stock	.80	@	.90
Ledgers and Writings	1.00	@	1.05
Manilas—			
New Manila Cut	1.25	@	1.40
Printed Manilas	.50	@	.60
Kraft	1.00	@	1.60
News and Scrap—			
Strictly Overissue	.55	@	—
Strictly Folded	.50	@	—
No. 1 Mixed Paper	.40	@	—

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.06¼	@	.06½
Fancy Shirt Cuttings	.02¼	@	.02½

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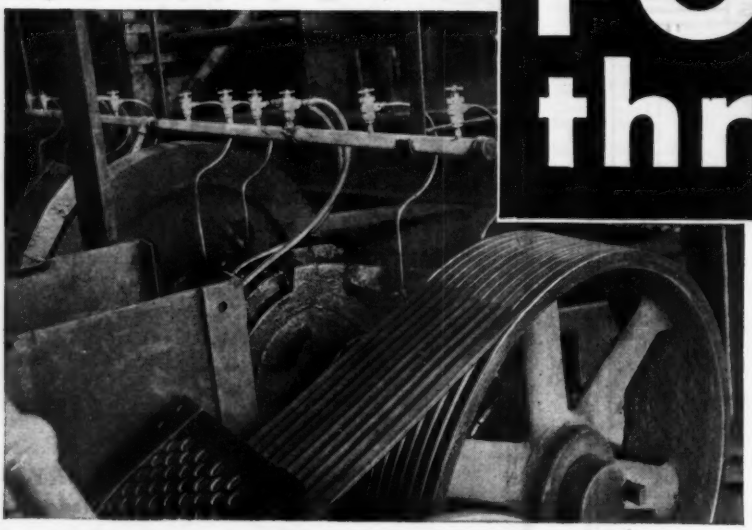

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